EPSON® EL 486UC

User's Guide

This manual is printed on recycled paper and is 100% recyclable.

FCC COMPLIANCE STATEMENT
FOR AMERICAN USERS

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio and television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ❑ Reorient or relocate the receiving antenna
- ❑ Increase the separation between the equipment and receiver
- ❑ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- ❑ Consult an experienced radio/TV technician for help.

WARNING

The connection of a non-shielded equipment interface cable to this equipment will invalidate the FCC Certification of this device and may cause interference levels that exceed the limits established by the FCC for this equipment, It is the responsibility of the user to obtain and use a shielded equipment interface cable with this device. If this equipment has more than one interface connector, do not leave cables connected to unused interfaces.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

FOR CANADIAN USERS

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

Le present appareil numérique n'emet pas de bruits radioéctriques depassant les limites applicables aux appareils numeriques de Classe B prescrites dans le reglement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

IMPORTANT NOTICE
DISCLAIMER OF WARRANTY

Epson America makes no representations or warranties, either express or implied, by or with respect to anything in this manual, and shall not be liable for any implied warranties of merchantability and fitness for a particular purpose or for any indirect, special, or consequential damages. Some states do not allow the exclusion of incidental or consequential damages, so this exclusion may not apply to you.

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Important Safety Instructions

1. Read all of these instructions and save them for later reference.
2. Follow all warnings and instructions marked on the computer.
3. Unplug the computer from the wall outlet before cleaning. Use a damp cloth for cleaning; do not use liquid or aerosol cleaners.
4. Do not spill liquid of any kind on the computer.
5. Do not place the computer on an unstable cart, stand, or table.
6. Slots and openings in the cabinet and the back or bottom are provided for ventilation; do not block or cover these openings. Do not place the computer near or over a radiator or heat register.
7. Operate the computer using the type of power source indicated on its label.
8. If you plan to operate the computer in Germany, observe the following safety precaution:

   To provide adequate short-circuit protection and over-current protection for this computer, the building installation must be protected by a 16 Amp circuit breaker.

   Beim AnschluB des Computers an die Netzversorgung muB sichergestellt werden, daB die Gebäudeinstallation mit einem 16 A Überstromschutzschalter abgesichert ist.

9. Connect all equipment to properly grounded (earthed) power outlets. If you are unable to insert the plug into an outlet, contact your electrician to replace your outlet. Avoid using outlets on the same circuit as photocopiers or air control systems that regularly switch on and off.
10. Do not allow the computer's power cord to become damaged or frayed.

11. If you use an extension cord with the computer, make sure the total of the ampere ratings of the devices plugged into the extension cord does not exceed the ampere rating for the extension cord. Also, make sure the total of all products plugged into the wall outlet does not exceed 15 amperes.

12. Do not insert objects of any kind into this product through the cabinet slots.

13. Except as specifically explained in this User's Guide, do not attempt to service the computer yourself. Refer all servicing to qualified service personnel.

14. Unplug the computer from the wall outlet and refer servicing to qualified service personnel under the following conditions:

    A. When the power cord or plug is damaged.

    B. If liquid has entered the computer.

    C. If the computer does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions. Improper adjustment of other controls may result in damage and often requires extensive work by a qualified technician to restore the computer to normal operation.

    D. If the computer has been dropped or the cabinet has been damaged.

    E. If the computer exhibits a distinct change in performance.

Instructions Importantes de Sécurité

1. Lire completement les instructions qui suivent et les conserver pour references futures.
2. Bien suivre tous les avertissements et les instructions indiqués sur l'ordinateur.
3. Debrancher l'ordinateur de toute sortie murale avant le nettoyage. Utiliser un chiffon humide; ne jamais utiliser un nettoyeur liquide ou une bonbonne aerosol.
4. Ne jamais renverser un liquide d'aucune sorte sur l'ordinateur.
5. Ne pas placer l'ordinateur sur un chariot, un support, ou une table instable.
6. Les events dans les meubles, a l'arriere et en dessous sont conçus pour l'aération; on ne doit jamais les bloquer. Ne pas placer l'ordinateur près d'une source de chaleur directe.
7. Le fonctionnement de l'ordinateur doit s'effectuer conformément au type de source d'alimentation indiquée sur l'etiquette.
8. Lorsqu'on desire utiliser l'ordinateur en Allemagne, on doit observer les normes securitaires qui suivent:

   Afin d'assurer une protection adequate a l'ordinateur contre les court-circuits et le survoltage, l'installation de l'edifice doit comprendre un disjoncteur de 16 amp.
9. On doit brancher tout l'equipement dans une sortie reliée à la masse. Lorsqu'il est impossible d'insérer la fiche dans la prise, on doit retenir les services d'un électricien ou remplacer la prise. Ne jamais utiliser une prise sur le même circuit qu'un appareil a photocopie ou un système de controle d'aération avec commutation marche-arrêt.
10. S'assurer que le cordon d'alimentation de l'ordinateur n'est pas effrité.

11. Dans le cas où on utilise un cordon de rallonge avec l'ordinateur, on doits' assurer que la valeur totale d'amperes branches dans le cordon n'excede en aucun temps les amperes du cordon de rallonge. La quantité totale des appareils branches dans la prise murale ne doit jamais exceder 15 amperes.

12. Ne jamais inserer un objet de quelque sorte que ce soit dans les cavites de cet appareil.

13. Sauf tel que specific dans la notice d'utilisation, on ne doit jamais tenter d'effectuer une reparation de l'ordinateur. On doit referer le service de cet appareil a un technicien qualifie.

14. Debrancher l'ordinateur de la prise murale et confier le service au personnel de service qualifie selon les conditions qui suivent:

    A. Lorsque le cordon d'alimentation ou la prise sont endommages.

    B. Lorsqu'un liquide s'est infiltre dans l'ordinateur.

    C. Lorsque l'ordinateur refuse de fonctionner normalement même en suivant les instructions. N'ajuster que les commandes qui sont énumérées dans les instructions de fonctionnement. Tout ajustement inadéquat de tout autre contrôle peut provoquer un dommage et souvent necessiter des reparations élaborées par un technicien qualifié afin de remettre l'appareil en service.

    D. Lorsqu'on a echappe l'ordinateur ou que l'on a endommagé le boitier .

    E. Lorsque l'ordinateur demontre un changement note au niveau de sa performance.

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Introduction

Your new Epson® EL 486UC computer is a fast, high-performance, all-in-one system offering flexibility and expandability in a compact design. It provides the following features:

- 486SX, 25 MHz microprocessor upgradable to 486SX/33, 486DX/33,486DX2/50, or 486DX2/66
- 4MB of internal memory, expandable to 32MB
- System and video BIOS shadow RAM
- 8KB of internal processor cache and support for 32KB or 128KB of external cache
- 512KB of on-board video memory, expandable to 1MB
- Built-in VGA port
- Two built-in serial ports, one built-in parallel port, and one built-in game port
- Built-in PS/2 compatible keyboard port
- Three l&bit, full-length and two B-bit, half-length ISA option slots
- Support for up to three mass storage devices
- Password security.

Using the built-in interfaces, you can connect most of your peripheral devices directly to the computer so you do not have to install option cards. You can use the option slots to enhance your system with extra functions such as a modem card, a network controller card, or additional interface ports.

The shadow RAM feature speeds up processing by moving the system and video BIOS into the RAM area of memory.

With 512KB of video RAM, the VGA controller supports standard resolutions up to 640 x 480 in 16 colors and extended resolutions up to 640 x 480 in 256 colors or 1024 x 768 in 16 colors (interlaced or non-interlaced). With 1MB of video memory, the controller supports extended resolutions up to 1024 x 768 in up to 256 colors.

VGA *Utilities*

Your computer comes with special VGA drivers and utilities for use with the integrated VGA interface. With these drivers, you can take advantage of the extended VGA features such as high resolutions and 132-column text mode when you run popular application programs. Drivers for common applications are described in Chapter 5.

Optional Equipment

You can easily upgrade your computer by installing a wide variety of options, as described in Chapters 3 and 4.

Microprocessor

You can upgrade your system with these microprocessors:

- 486SX/33
- 486DX/33
- 486DX2/50
- 486DX2/66.

Math coprocessor

You automatically install a math coprocessor when you upgrade your system with a 486DX microprocessor, because the coprocessor is built into the 486DX chip.

Memory

By adding 1MB, 4MB, 8MB, and 16MB SIMMs (single inline memory modules) to the main system board, you can expand the computer's memory up to 32MB.

Your system also supports video memory upgrades to 1MB and cache memory upgrades of either 32KB or 128KB.

Drives

Your system can support up to three internal mass storage devices, including hard disk drives, diskette drives, a tape drive, or a CD-ROM drive. As your storage needs expand, you can install additional drives.

How to Use This Manual

This manual contains the information you need to get the best results from your computer. You do not have to read everything in this book; check the following summary.

Chapter 1 provides simple instructions for setting up your system and connecting peripheral devices such as the monitor and printer. It also describes running the SETUP program to define your computer's configuration.

Chapter 2 covers general operating procedures such as resetting the computer, using the password, and changing the processor speed.

Chapter 3 describes how to remove and replace the computer's cover, change jumper settings, and install optional equipment such as microprocessor upgrades, option cards, and memory modules.

Chapter 4 explains how to install and remove disk drives.

Chapter 5 describes how to install VGA drivers.

Chapter 6 contains troubleshooting tips.

Appendix A lists the specifications of your computer, the operating environments that have been tested on your system, and options available from Epson.

At the end of this manual you'll find an **Index** and a list of international marketing locations.

Where to Get Help

If you purchased your computer outside the United States, please contact your dealer or the marketing location nearest you for customer support and service. International marketing locations are listed at the back of this manual.

If you purchased your computer in the United States, Epson provides the following support services through Epson Direct" and the Epson Connection":

- ❑ Technical assistance with the installation, configuration, and operation of Epson products
- ❑ On-site Servicer referral

- Assistance in locating your nearest Authorized Epson Reseller or Service Center
- Sales of ribbons, supplies, parts, documentation, and accessories for your Epson product
- Sales of Epson computers and accessories through Epson Direct at (800) 374-7300
- Customer Relations
- Epson technical information library fax service-also available directly by calling the toll number (310) 782-4214
- Product literature with technical specifications on our current and new products
- User group locations.

If you need help with any software you are using, see the documentation that came with it for technical support.

Epson Connection: (800) 922-8911

Epson Direct: (800) 374-7300

Chapter 1

Setting Up Your System

This chapter briefly describes how to set up your computer. It includes the following information:

- ❑ Getting started
- ❑ Connecting the computer
- ❑ Running the SETUP program
- ❑ Post-SETUP procedures.

Getting Started

Follow the instructions below for choosing a location for your new system and unpacking it.

Choosing a Location

When you are ready to set up your system, choose a safe, convenient location that provides the following:

- ❑ A flat, hard surface. Surfaces like beds and carpets attract static electricity, which can erase data on your disks, damage the computer's circuitry, and prevent proper ventilation.
- ❑ Moderate environmental conditions. Select a cool, dry area and protect your computer from extremes in temperature, humidity, dust, and smoke. Avoid direct sunlight or other sources of heat.

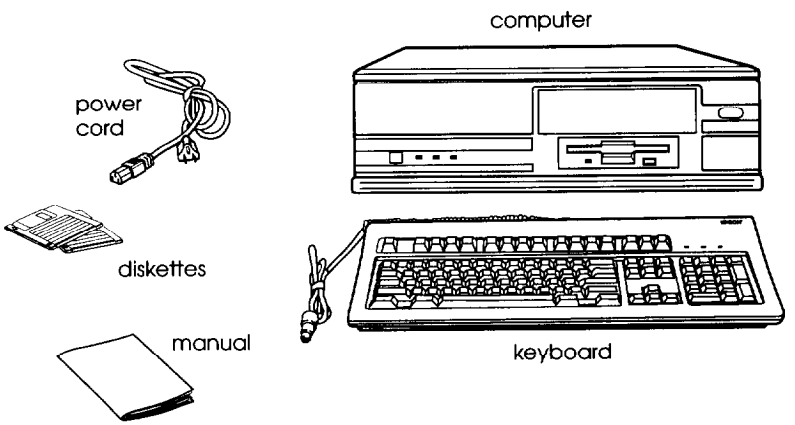
- ❑ Good air circulation. Leave several inches of space around the computer so air can move freely.

- ❑ No electromagnetic interference. Do not place your system too close to any electrical device, such as a telephone or television, which generates an electromagnetic field.

- ❑ Appropriate power source. Connect all your equipment with the appropriate power cords for the power source in your area.

Unpacking Your Computer

When you unpack your system components, make sure you have these items:

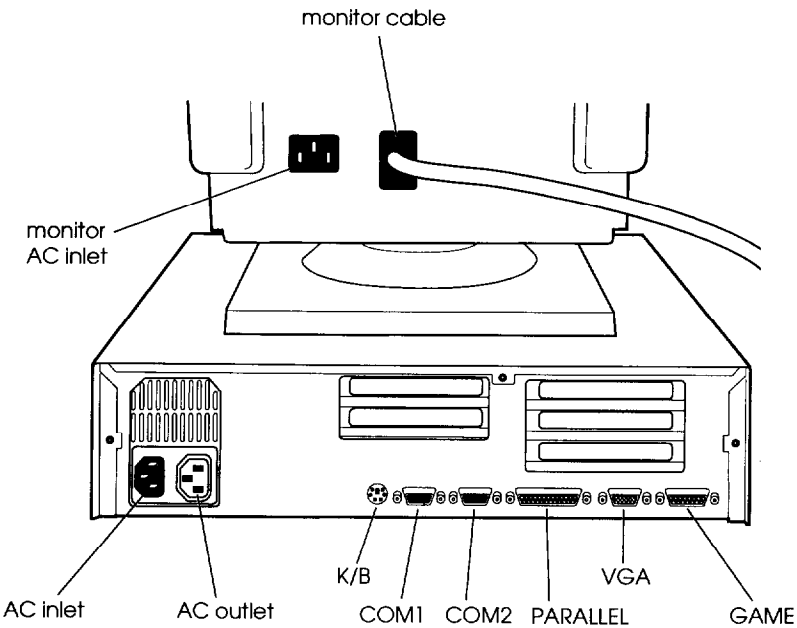


Your system also includes a serial mouse and may come with the operating system and software already installed on a hard disk drive.

If you purchased any optional equipment that wasn't installed at the factory-such as option cards, memory modules, a hard disk, or a diskette drive-you should install these options before you connect your computer. See Chapters 3 and 4 for instructions.

Connecting the Computer

Use the illustration below to locate the ports on the back of your system as you connect the keyboard, monitor, printer, and other devices.



Connecting a Keyboard

To connect a keyboard, hold the cable connector so the arrow on the connector faces up. Insert it into the port marked K/B.

Connecting a Mouse

Your system came with a serial mouse that connects to either of the computer's built-in serial ports. To connect the mouse, insert the connector into one of the ports marked COMl and **COM2.**

When you install the drivers for your mouse, make sure you identify the port to which you connected it. See the README file on the diskette that came with your mouse for more information.

Connecting a Monitor

The way you connect your monitor to the computer depends on the type of monitor you have. If you have a VGA monitor (or a multifrequency monitor with an analog connector), you can connect it to the computer's built-in VGA port as described below. If you are connecting your monitor to an adapter card, see Chapter 3.

1. Place your monitor on top of or near the computer. Turn the monitor and computer around so the backs are facing you.

2. There should be two cables provided with your monitor: the monitor cable (to connect it to the computer) and the power cable (to connect it to the power source). On most monitors, the monitor cable is permanently attached to the monitor. If your monitor does not have an attached cable, connect the cable to it now.

3. Examine the connector on the monitor cable and line it up with the VGA port on the computer. Then insert the connector into the port.

> **Caution**
> To avoid damaging the connector, be careful not to bend the pins when you insert it.

4. If the connector has retaining screws, tighten them.

5. Plug the monitor power cord into the monitor's power inlet.

6. Plug the other end of the power cord into an appropriate grounded electrical outlet or into the power outlet on the back of the system.

> **Caution**
> Before you plug the monitor's power cord into the back of your computer, make sure the monitor's power requirements do not exceed 1 Amp.

Connecting a Printer or Other Device

Your computer has one parallel and two serial ports. To connect a printer or other peripheral device, follow the appropriate instructions below.

Using the parallel port

Follow these steps to connect a parallel printer to your computer:

1. Place the printer next to the computer so that the backs are facing you.

2. Align the connector end of the printer cable with the **PARALLEL** port and plug it in. If the connector has retaining screws, tighten them.

3. Connect the other end of the cable to the printer. To secure the cable, squeeze the clips at each side of the printer port and push them into place.

4. Plug the printer's power cord into an appropriate grounded electrical outlet.

Using the serial ports

If you have a printer, a modem, or a mouse with a serial interface, you can connect it to one of the serial (Rs232C) ports on the back of the computer. Make sure you have a cable compatible with a DB-9P connector.

To connect a serial device, insert the connector into one of the ports marked **COM1** and COM2. If you are connecting only one serial device, use the **COM1** port.

Connecting the Power Cord

Follow these steps to connect the power cord:

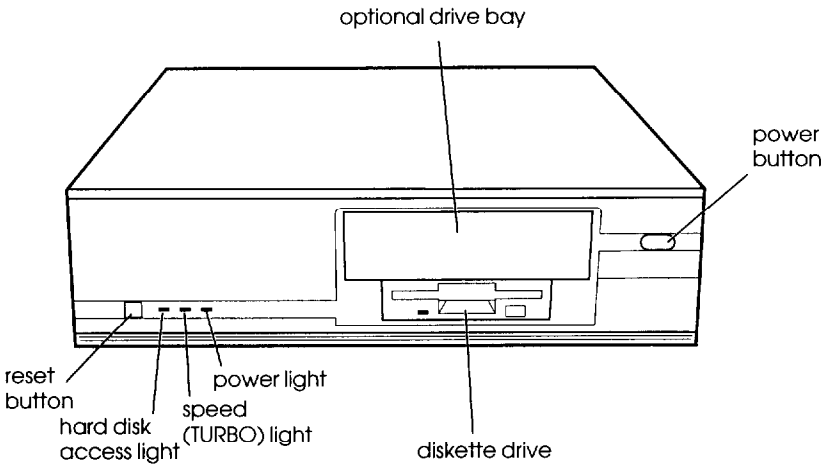
1. Plug the power cord into the power inlet on the back panel.

> **Warning**
> To avoid an electric shock, be sure to plug the cord into the computer before plugging it into the wall outlet.

2. Plug the other end of the power cord into an appropriate grounded electrical outlet.

Turning On the Computer

After you set up your system, you are ready to turn on the power. Use the illustration below to identify the parts of your system.



Before you turn on your computer, check the following safety rules to avoid accidentally damaging your computer or injuring yourself:

- ❑ Do not connect or disconnect any peripheral device cables (including the keyboard or a mouse) or power cables when the computer's power is on.
- ❑ Never turn off or reset your computer while a disk drive light is on. This can destroy data stored on the disk.
- ❑ Always wait at least 20 seconds after you turn off the power before you turn it on again. This prevents possible damage to the computer's electrical circuitry.
- ❑ Do not leave a beverage near your system. Spilled liquid can damage the circuitry of your equipment.

Follow these steps to turn on your system:

1. Turn your computer around so the front panel faces you. Place your monitor, printer, and other devices in a convenient arrangement.

2. If there is a protective card in the diskette drive, remove it now.

3. Turn on the monitor, printer, and any other devices connected to the computer.

4. Turn on the computer by pressing the power button on the right side of the front panel.

   The power indicator lights up, then the screen displays a count of the system memory. The computer performs its power-on diagnostics, which are a series of checks that make sure everything is working correctly.

5. If necessary, use the controls on your monitor to adjust the brightness and contrast until you can easily see the characters on the screen.

   If your system is configured to automatically load a program (such as Microsoft Windows or a word processing program), you see the first menu or screen display of that program. If not, you may see the operating system prompt, such as c:\>orA:\>.

   If there is no operating system installed on your computer, you see an error message. Ignore the message for now; once you install the operating system, you will not see this message.

Now follow the instructions in the next section to configure your system using the SETUP program.

Running the SETUP Program

You need to run the SETUP program the first time you use your computer. If your system was configured for you, you may still need to set the date and time. If your system came unconfigured, you need to define how it is set up. You may need to run the program again later if you change your configuration.

SETUP is stored in the computer's ROM BIOS (read-only memory, basic input/output system), so you can run it any time. SETUP lets you verify or change the following:

- Current date and time
- Type of diskette drive(s) and hard disk drive(s)
- System memory
- Type of video display adapter
- Keyboard options
- Processor speed
- Password
- System booting sequence
- External cache
- Shadow and memory mapping options.

The configuration information is stored in an area of memory called CMOS RAM. This memory is backed up by a battery, so it is not erased when you turn off or reset the computer.

Starting the SETUP Program

You can run SETUP whenever you see the operating system command prompt, such as:

```
C:\>  or  A:\>
```

To start SETUP, hold down Ctrl and Alt, then press S.

Also, whenever you start your computer, if the system detects an error in your system configuration, you will see the following message:

```
Press the F1 key to continue, F2 to run the
setup utility
```

If you see this message, press F2 to run the SETUP program to correct your configuration.

The table below lists the keys you can use to perform SETUP operations.

SETUP function keys

Key	Function
↑ ↓ ← →	Move the cursor to the next or previous modifiable option
+ −	Change the values in the field
PgDn PgUp	Display the other SETUP screen
F1	Displays a help screen describing the option currently selected
F4	From the exit menu, saves the changes you have made and restarts your computer
F5	From the exit menu, supplies the factory default values for all SETUP options
F6	From the exit menu, leaves the SETUP program without saving any changes
Esc	Displays the exit menu

Whenever you are in the SETUP program, the bottom of the screen lists the keys you can press to perform specific functions.

Displaying System Information

The SETUP program provides a system information screen that lists the following:

- Processor type
- Coprocessor type (if you've installed a 486DX microprocessor upgrade)
- Reserved memory
- BIOS version number
- Addresses for video mode, serial ports, and printer ports
- Option ROMs (if any ROM exists on your installed option cards).

To see this information, press F2 from either of the SETUP screens.

Setting the Date and Time

The real-time clock in your computer continuously tracks the date and time-even when the computer is turned off. Once you set the System Time and System Date options using SETUP, you should not need to change them, unless you adjust the time for daylight savings or other seasonal adjustments. (The computer automatically changes the date for leap years.)

Use ↑, ↓, ←, or → to move the cursor to the value you want to change. Then press + or - until you see the value you want.

Setting the Diskette Drive(s)

On your system, diskette drive A is the 3.5-inch high-density drive installed in the lower drive bay on your system. You may also have another drive of a different size or capacity; this is drive B. Check the settings for both drives and correct them if necessary.

> **Note**
> If you add a diskette drive and want to reassign the top drive as drive A, you must change jumpers J35, J36, J37, and J38, as described in Chapter 3. Then run SETUP to reassign drive types.

Setting the Hard Disk Drive(s)

The SETUP program lets you select the type of hard disk drive(s) installed in your computer. Follow these guidelines:

- If your system does not have a hard disk, select **`Not Installed for Hard Disk 1 and Hard Disk 2`**.
- If your computer came with an Epson-installed hard disk drive, you need to define your own drive type. For more information, see "Defining your own drive type" on page 1-15.
- If you have installed another type of hard disk drive, you need to select the drive type number that matches your drive.

Hard disk drive types

The table below lists standard hard disk drives. Check this table and your drive documentation to find the correct type number. If none of the types listed matches your drive, see page 1-15.

Hard disk drive types

Type	Cyl	Hd	Pre	LZ	Sec	Size* (MB)
1	306	4	128	305	17	10
2	615	4	300	615	17	20
3	615	6	300	615	17	30
4	940	8	512	940	17	62
5	940	6	512	940	17	46
6	615	4	-1	615	17	20
7	462	8	256	511	17	30
8	733	5	-1	733	17	30
9	900	15	-1	901	17	112
10	820	3	-1	820	17	20
11	855	5	-1	855	17	35
12	855	7	-1	855	17	49
13	306	8	128	319	17	20
14	733	7	-1	733	17	42
16	612	4	0	663	17	20
17	977	5	300	977	17	40
18	977	7	-1	977	17	56
19	1024	7	512	1023	17	59
20	733	5	300	732	17	30
21	733	7	300	732	17	42
22	733	5	300	733	17	30
23	306	4	0	336	17	10

Hard disk drive types (continued)

Type	Cyl	Hd	Pre	LZ	Sec	Size* (MB)
24	Drive table entry unused					
25	615	4	0	615	17	20
26	1024	4	-1	1023	17	34
27	1024	5	-1	1023	17	42
28	1024	8	-1	1023	17	68
29	512	8	256	512	17	34
30	615	2	615	615	17	10
31	989	5	0	989	17	41
32	1020	15	-1	1024	17	127
33	615	4	-1	615	26	31
34	820	6	-1	820	26	62
35	1024	9	1024	1024	17	76
36	1024	5	512	1024	17	42
37	1024	5	512	1024	26	65
38	823	10	256	824	17	68
39	615	4	128	664	17	20
40	615	8	128	664	17	40
41	917	15	-1	918	17	114
42	1023	15	-1	1024	17	127
43	823	10	512	823	17	68
44	820	6	-1	820	17	40
45	1024	5	-1	1023	17	42
46	925	9	-1	925	17	69
47	699	7	256	700	17	40
48, 49	User-defined drive type					

* Actual formatted size may be slightly different than size on drive label.

Defining your own drive type

If the parameters for your hard disk (listed in its documentation) do not match any of the types listed in the table above, you can define your own type. Follow these steps:

1. Move your cursor to **Hard Disk 1** or 2 and press + or - until you see drive type 48 or 49.

2. Press → to move the cursor to the **Cyl** field.

3. Type the appropriate cylinder value for your hard disk. The documentation that came with your hard disk drive will provide the appropriate information.

4. Continue pressing → to move the cursor to the **next** field and type in the appropriate values,

If you are installing Epson-supplied drives, use **the** information in the following table to define your drive type.

Epson-supplied **hard** *disk drive types*

Epson drive options	Cyl	Hd	Pre	LZ	Sec	Size* (MB)
80MB (Conner) **	903	4	-1	902	46	81
120MB (Conner) **	762	8	-1	761	39	115
170MB (Conner) **	903	8	-1	902	46	162
240MB (Quantum)	723	13	-1	722	51	234
251MB (Conner)	895	10	-1	894	55	240

. Actual formatted size may be slightly different than size on drive label.

** If you have one of these hard disk drives, make sure you set the **Shadow BIOS ROM** OptiOn to **WP-Shadow** or **Cacheable.**

Note
If you install NetWare 286, version 2.2, do not assign a user-defined disk drive type. Use the pre-defined hard disk drive type that most closely matches the drive you are installing.

Checking System Memory

Your computer comes with 4MB of RAM on a SIMM. DOS and application programs that run under DOS use the first 640KB of memory. You can use the memory above 1MB as extended memory.

When you boot your system, the system BIOS detects the type of RAM and updates the total memory size automatically. You see the memory configuration displayed in the **Base Memory** and **Extended Memory** fields on this SETUP screen.

You may need to change these values if you install optional memory (for instance, a memory option card) that the BIOS doesn't automatically recognize when you start your system. Change the values in these fields to reflect your additional memory. When you restart your system, all memory, including the additional memory, will be available.

Setting the Video Display Type

The **Video Card** option lets you define the type of adapter you are using for your primary display. If you connected your monitor to the computer's built-in VGA port, select **EGA/VGA**. If you installed an optional video card, follow the guidelines below to select the correct adapter type.

Video *display type options*

Select	If
EGA/VGA	You connected your monitor to the built-in VGA port or you installed a VGA or enhanced graphics adapter (EGA) card
CGA40	You installed an optional color graphics adapter set to 40-column color graphics adapter (CGA) mode
CGA80	You installed a CGA or a multi-mode graphics adapter (MGA) attached to a color monitor
MONO *	You installed a monochrome monitor that isn't VGA compatible

* If you select **MONO**, make sure you change jumper J6 to position 2-3.

Note
If you want to use a color adapter that isn't VGA compatible, you must have your service representative disable the built-in VGA adapter.

Setting Keyboard Options

Two options in the SETUP program allow you to control keyboard settings: the **Keyboard** option and the **NumLock on at boot** option.

For this system, the **Keyboard** option in the SETUP program has no effect.

The **NumLock on at boot** option determines the initial state of the num lock function when you turn on or reset your system. When num lock is off, the keypad controls cursor movement. If num lock is on, the keypad types numbers.

Select **YES** to set the num lock function on when the system starts.

Setting the Processor Speed

The **CPU Speed** option sets the processor speed to fast or slow. At fast speed, your processor operates at its fastest speed (25,33, 50, or 66 MHz, depending on the speed of your microprocessor). At the slow speed setting, the processor operates at 8 MHz to provide compatibility with older application programs.

Setting the Password

The SETUP program lets you enter or delete an optional password to control access to your system.

To set a password, move the cursor **to** the **Password** option on the second SETUP screen and press Enter. When you see the O—m, t ype the password you want to use. This password can be up to seven characters. When you press Enter again, you see the word "Set" displayed for the **Password** option.

To delete a password you've entered, move the cursor to the **Password** option and press Enter. You see this symbol: : O—m. Type your password and press Enter. You see "Not set" at the **Password** option.

Setting the Boot Sequence

The **Boot sequence** option determines the order in which the computer checks the drives when it looks for the operating system.

If you select **C : > A:,** each time you turn on the computer, it tries to load the operating system from drive C. If drive C doesn't contain an operating system, the computer loads the operating system from drive A. If you select **A: > C :**, the computer tries to load the operating system from drive A first. If drive A doesn't contain an operating system, the computer tries to load it from drive C.

Enabling an External Cache

If you have installed external cache in your system, set the **External Cache** option **to Enabled.You must also set your** shadow video and BIOS options **to Cacheable** or **WP-Shadow.**

Setting Shadow ROM Options

Your computer can access RAM faster than ROM. Two options, **Shadow BIOS** ROM and **Shadow Video ROM, allow your** system to copy the contents of its system and/or video ROM into RAM **(WP-Shadow)** or external cache, if you have some installed **(Cacheable).** When you use shadowing or the external cache, your system can perform certain operations faster. You cannot enable **Memory Remapping** when you enablethe **Shadow Video ROM** and the **Shadow BIOS ROM** options.

> **Note**
> For the best system performance, always set the **Shadow BIOS ROM** or the **Shadow Video ROM** options to **WP-Shadow** or **Cacheable**.

Remapping Memory

The **Memory Remapping** option allows you to relocate 384KB of memory to the top addresses of DRAM. You must disable this option if you have enabled both the **shadow Video ROM** and the **Shadow BIOS ROM** options or any of the **Shadow 16K** options that shadow memory at an address that begins with "D."

Using Other Shadow Options

Eight additional shadow options are available, allowing you to shadow 16KB at the memory address listed on the screen. You may want to enable one or more of these shadow options if you are using option cards that contain ROM. Using these options, you can shadow the memory on the card to your system's RAM or external cache (if one is installed). Check the documentation that came with your option card to determine which addresses your option card can access. You may also need to set some switches or jumpers on your option card.

If you enable the **Memory Remapping** option, you cannot enable the last four of these **Shadow** options because they access the same memory addresses.

Exiting the SETUP Program

When you leave the SETUP program, you can save your settings and reboot your system, or exit SETUP without saving your settings. You can also return all values to the factory defaults.

To leave the SETUP program, press **Esc** from any SETUP screen. From the SETUP exit menu, press these keys to perform the following functions:

Esc	Returns to the SETUP utility
F4	Saves the changes you have made to your configuration and restarts your computer
F5	Supplies the factory default values for all SETUP options
F6	Exits the SETUP utility and returns to the system prompt without saving any changes.

Post-SETUP Procedures

After you run SETUP for the first time, you may need to install the operating system on your computer. See your operating system manual for instructions.

Once you have installed your operating system, install any software you plan to use. See your application program manuals for instructions.

You may also want to install the optional extended video drivers for some of your application programs. See Chapter 5 for more information.

Turning Off the Computer

Whenever you turn off your system, follow these steps:

1. Save your data and exit any application program you are using.

2. Check the hard disk drive light and the diskette drive light(s) to make sure they are not on. Do not turn off the computer if a drive light is on, because you can damage the drive or lose data.

3. Remove any diskette(s) from the diskette drive(s).

4. Press the power button to turn off the computer and then turn off the monitor, printer, and any other peripheral devices.

Chapter 2

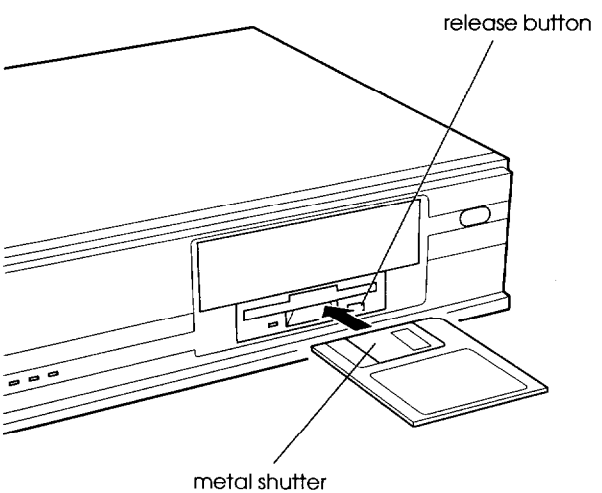
Using Your Computer

This chapter briefly describes the following operations:

- Inserting and removing diskettes
- Stopping a command or program
- Resetting the computer
- Using the password
- Changing the processor speed.

Inserting and Removing Disks

To insert a diskette into a 3.5-inch drive, hold the diskette with the label facing up and the metal shutter leading into the drive, as shown in the following illustration. Slide the diskette into the drive until it clicks into place.



To insert a diskette into a 5.25-inch drive, hold the diskette with the label facing up and the read/write slot leading into the drive.

When you want to remove the diskette, make sure the drive light is off; then press the release button or turn the latch. Remove the diskette and store it properly.

> **Caution**
> Never remove a diskette or reset or turn off the computer while a diskette drive light is on. You could lose data, Also, remove all diskettes before you turn off the computer.

Stopping a Command or Program

You may sometimes need to stop a command or program while it is running. If you have entered a DOS or application program command that you want to stop, try one of the following:

Press Pause

- Hold down Ctrl and press C
- Hold down Ctrl and press Break.

If these methods do not work, you may need to reset the computer as described below. Do not turn off the computer to exit a program or stop a command unless you have to, because the computer erases any data you did not save.

Resetting the Computer

Occasionally, you may want to clear the computer's current settings or its memory without turning it off. You can do this by resetting the computer.

For example, if an error occurs and the computer does not respond to your keyboard entries, you can reset it to reload your operating system and try again. However, resetting erases any data in memory that you have not saved; so reset only if necessary.

> **Caution**
> Do not reset the computer to exit a program. Some programs classify and store new data when you exit them. If you reset the computer without properly exiting a program, you may lose data.

When you reset the computer, the operating system must be either on the hard disk or on a diskette in drive A; so if you do not have a hard disk, insert the operating system diskette in drive A. If you are using DOS, you can hold down Ctrl and Alt and press Del.

You can also press the RESET button located on the front left side of your computer. (See the illustration on page 1-7 to locate the RESET button.) The screen displays nothing for a moment and then the computer should reload the operating system.

If resetting the computer does not correct the problem, you probably need to turn it off and on again. Remove any diskette(s) from the diskette drive(s). Turn off the computer and wait 20 seconds. If you do not have a hard disk, insert the operating system diskette in drive A. Then turn on the computer.

Using a Password

If you set a password when you ran the SETUP program, you must enter it every time you turn on or reset the computer. Follow these steps to use your password:

1. If you do not have a hard disk, insert your operating system diskette in drive A.

2. Turn on or reset the computer. You see this prompt:

   ```
   PASSWORD PLEASE:
   ```

3. Type your password. You see an asterisk for each character you type. Then press Enter.

4. After you type the password correctly and press Enter, you see the message, ***OK***! The computer loads the operating system and displays the command prompt.

If you don't enter the correct password the first time you type it, you can try two more times. If you haven't entered the correct password on the third try, the computer locks up to prevent unauthorized access.

> **Note**
> If you want to delete your password, you must run the SETUP program and follow the instructions for deleting a password in Chapter 1.

If you do not remember your password, see "Password Problems" in Chapter 6.

Changing the Processor Speed

Your computer's processor can operate at two speeds: fast speed (the speed of your microprocessor) or slow speed (8 MHz). The slow speed is available to provide compatibility with older application programs.

When your computer is operating at fast speed, the TURBO light on the front panel is on. When the computer is operating at slow speed, the light is off.

You should use fast speed for almost everything you do because your programs will work faster. However, certain application programs have specific timing requirements and can run only at the slower speed. See your software manual to determine if this is the case.

Some copy-protected programs require the computer to run at slow speed while accessing the program on a diskette. These programs also usually require you to leave a key disk-the diskette that contains the copy protection-in the diskette drive. If you use a copy-protected program, you can change the speed to slow to access the diskette and return it to fast speed when you are finished.

You can change the processor speed temporarily by entering one of the following commands from the numeric keypad on your keyboard:

- To select slow speed, hold down the Ctrl key and the Alt key simultaneously and then press the - key on the numeric keypad. The speed light turns off.

- To select fast speed, hold down the Ctrl and Alt keys and press + on the numeric keypad. The speed light comes on.

Note
You can use the commands listed above while you are running a program. However, if the program uses one of these commands for another function, you cannot use it to change the processor speed. You can, however, change the processor speed through the SETUP program.

The speed setting remains in effect until you do the following:

- ❑ Reset your computer
- ❑ Turn off your computer
- ❑ Change the speed with another keyboard command
- ❑ Change the speed setting in the SETUP program.

Chapter 3

Installing and Removing Options

You can enhance the performance of your computer by adding optional equipment such as system, video, or cache memory modules, option cards, or a microprocessor upgrade.

This chapter first describes how to remove your computer's cover to install options and how to replace the cover when you are finished. It then describes the following:

- ❑ Locating the internal components
- ❑ Changing the jumper settings
- ❑ Installing and removing SIMMs (single inline memory modules)
- ❑ Installing and removing option cards
- ❑ Removing and re-installing the option card connector board
- ❑ Adding video memory
- ❑ Installing external cache
- ❑ Installing microprocessor upgrades.

> **Caution**
> Never install options or change jumper settings when the computer is turned on or the power cord is connected to the computer.

Once you have installed your option, see "Post-installation Procedures" on page 3-30.

Removing the Cover

You need to remove the computer's cover to install any of the options described in this chapter or to install or remove a disk drive (as described in Chapter 4).

Follow these steps to remove the cover:

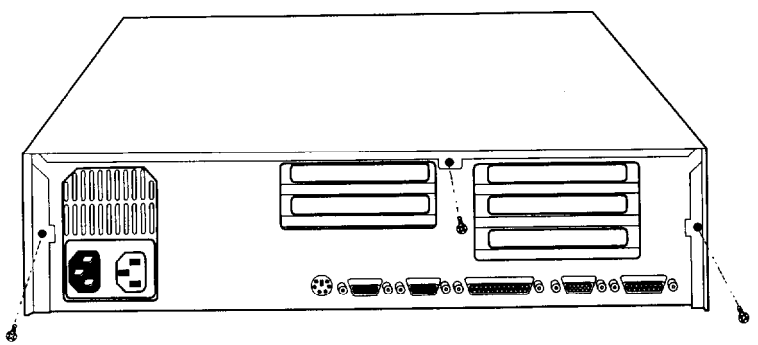
1. Turn off the computer and then any peripheral devices (including the monitor and printer).

2. Disconnect the computer's power cable from the electrical outlet and from the back panel. Also disconnect any cables that are connected to the computer, including the keyboard cable.

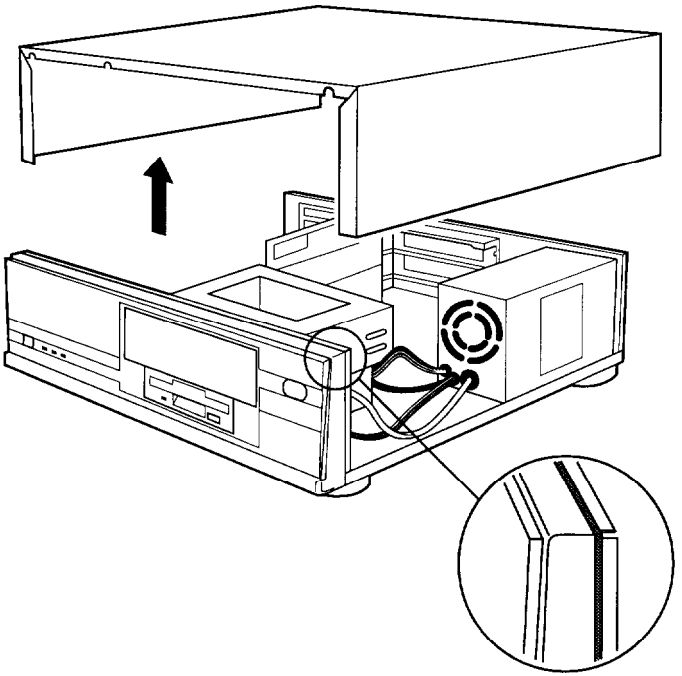
3. If the monitor is on top of the computer, lift it off and set it to one side.

4. Turn the computer around so the back panel is facing you.

5. Remove the three screws securing the back panel.



6. Grasp the sides of the cover and lift it straight up, as shown below:



7. Set the cover aside.

8. Ground yourself to the computer by touching the metal surface of the back panel.

Warning
Be sure to ground yourself by touching the back panel of the computer every time you remove the cover. If you are not properly grounded, you could generate an electric shock that could damage a component when you touch it.

Replacing the Cover

When you are ready to replace the computer's cover, follow these steps:

1. Make sure all the internal components are installed properly.

2. Check all cable connections, especially those that might have been loosened during your work.

3. Make sure all cables are out of the way so they do not catch on the cover.

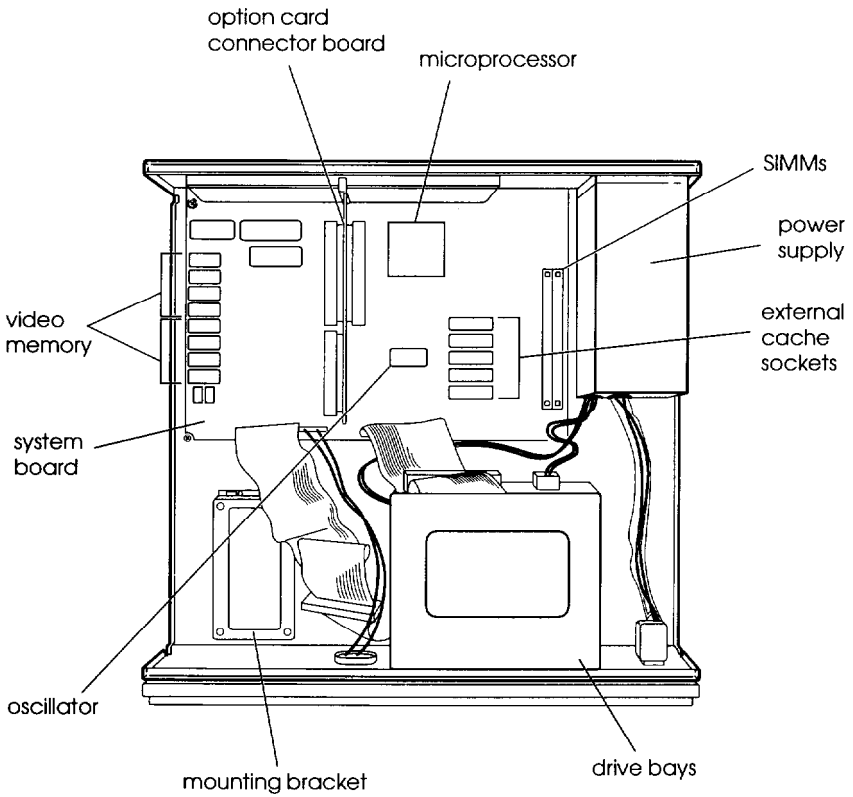
4. Insert the front of the cover between the front bezel and the chassis of the computer and guide it straight down. (See the illustration on page 3-3.)

5. Replace the three cover retaining screws.

6. Reconnect the computer to the monitor, printer, keyboard, and any other peripheral devices you have. Then reconnect the power cable to the back of the computer and to an electrical outlet.

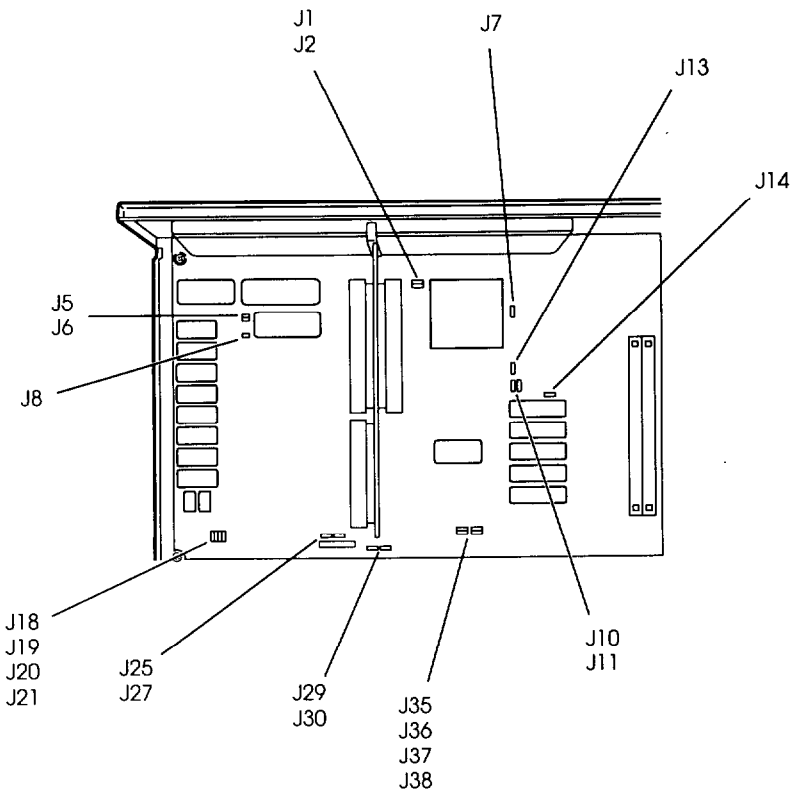
Locating the Internal Components

As you follow the instructions in this chapter, refer to the illustration below to locate the different components inside your computer.



Changing the Jumper Settings

The main system board in your computer has a number of jumpers that control certain functions. These jumpers are preset at the factory to default positions. See the illustration below to locate the jumpers on the system board.



Use the information in the following tables to change jumper settings, if necessary.

Jumper settings

Jumper number	Jumper setting	Function
J18	1-2* 2-3	Enables COM1 serial port Disables COM1 serial port
J19	1-2* 2-3	Assigns COM1 serial port as COM1 Assigns COM1 serial port as COM3**
J30	1-2* 2-3	Enables COM2 serial port Disables COM2 serial port
J29	1-2* 2-3	Assigns COM2 serial port as COM2 Assigns COM2 serial port as COM4**
J21	1-2* 2-3	Enables parallel port Disables parallel port
J20	1-2* 2-3	Assigns parallel port as LPT1 Assigns parallel port as LPT2**
J5	1-2* 2-3	Enables game port Disables game port
J27	1-2* 2-3	Enables diskette drive controller Disables diskette drive controller
J25	1-2* 2-3	Enables IDE hard disk drive controller Disables IDE hard disk drive controller
J6†	1-2* 2-3	Accesses VGA memory addresses Accesses monochrome memory addresses
J8	ON* OFF	Identifies an interlaced monitor Identifies a non-interlaced monitor

* Factory setting

** DOS automatically reassigns parallel and serial ports. Check your DOS manual for more information.

† If you change this jumper setting to position 2-3, make sure you select **MONO** for the **video Card** option in SETUP.

Drive assignment jumper setting

Drive assignment	J35	J36	J37	J38
Upper drive is A	1-2	1-2	1-2	1-2
Lower drive is A	2-3*	2-3*	2-3*	2-3*

* Factory setting

*External cache jumper settings**

Cache size	J7	J10	J11	J13	J14
32KB	Off	1-2	1-2	1-2	1-2
128KB	On	2-3	2-3	2-3	2-3

* If you have no external cache installed, the position of these jumpers does not matter.

Processor type jumper settings

Processor type	J1	J2
486DX/33	1-2	1-2 and 3-4
486SX/25 or 486SX/33	Off	2-3
486DX2/50 or 486DX2/66	1-2	1-2 and 3-4

Caution
Do not remove jumper J42. If J42 is off, your system cannot write to RAM.

Setting the Jumpers

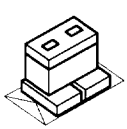
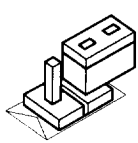
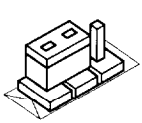
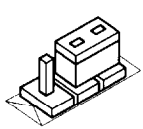
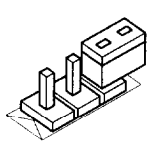
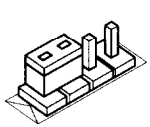
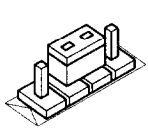
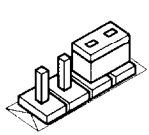
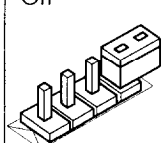
If you need to change any jumper settings, follow these steps:

1. Refer to the illustration on page 3-6 to locate the jumpers.

2. If there are any option cards installed in your computer, you need to remove them to access the jumpers. See page 3-17.

3. A jumper's setting is determined by where the jumper is placed on the pins. Use the following table to identify the pin settings for 2-pin, 3-pin, and 4-pin jumpers. To identify pin 1, look at the system board under the jumper. You will see a triangle traced on the board at pin 1.

Setting jumpers

Jumper type	Position			
2-pin	On 	Off 		
3-pin	1-2 	2-3 	Off 	
4-pin	1-2 	2-3 	3-4 	Off 

To move a jumper from one position to the other, use needle-nose pliers or tweezers to pull it off its pins and gently move it to the desired position.

> **Caution**
> Be careful not to bend the jumper pins or damage any components on the main system board.

4. Replace any option cards you removed. See page 3-14 for instructions.

Installing Memory Modules (SIMMs)

Your computer comes with 4MB of memory on a SIMM. By installing additional SIMMs, you can increase the amount of memory in your computer up to 32MB.

There are two SIMM sockets on the main system board, and each can contain one memory module. You can install lMB, 4MB, 8MB, and 16MB SIMMs. The following table shows the possible SIMM configurations; do not install memory in any other configuration.

SIMM configuration

Bank 0 (U46)	Bank 1 (U45)	Total memory
4MB		4MB*
4MB	1MB	5MB
4MB	4MB	8MB
8MB	4MB	12MB
8MB	8MB	16MB
16MB	16MB	32MB

* Standard memory configuration

Before you install SIMMs, check the following guidelines to ensure that they will work properly:

- ❑ Use only tin-plated, 36-bit, 72-pin, fast-page mode SIMMs that operate at an access speed of 70ns (nanoseconds) or faster. Be sure all the SIMMs operate at the same speed.

- ❑ Use the correct SIMM configuration to add the amount of memory you want. See the table above.

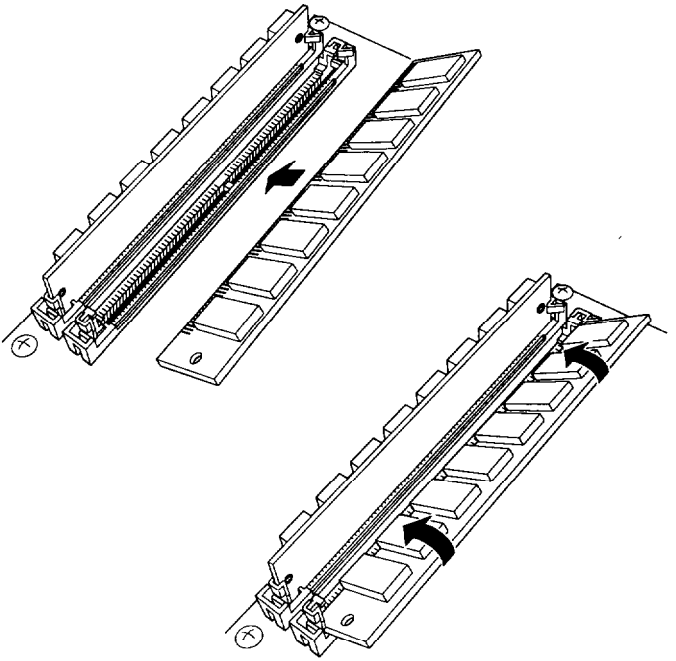
Inserting SIMMs

Follow these steps to install SIMMs:

1. Refer to the illustration on page 3-5 to locate the SIMM sockets near the front of the system board.

2. Remove any option cards that may be blocking your access to the SIMM sockets. (See page 3-17 for instructions.)

3. Position the SIMM at an angle over the empty SIMM socket, as shown below. The components on the SIMM should face the power supply.



4. Push the SIMM into the socket until it is seated firmly in the slot. Then tilt it upright, as shown above, guiding the hole at each end of the SIMM over the retaining post at each end of the SIMM socket. If it does not go in smoothly, do not force it; pull it all the way out and try again.

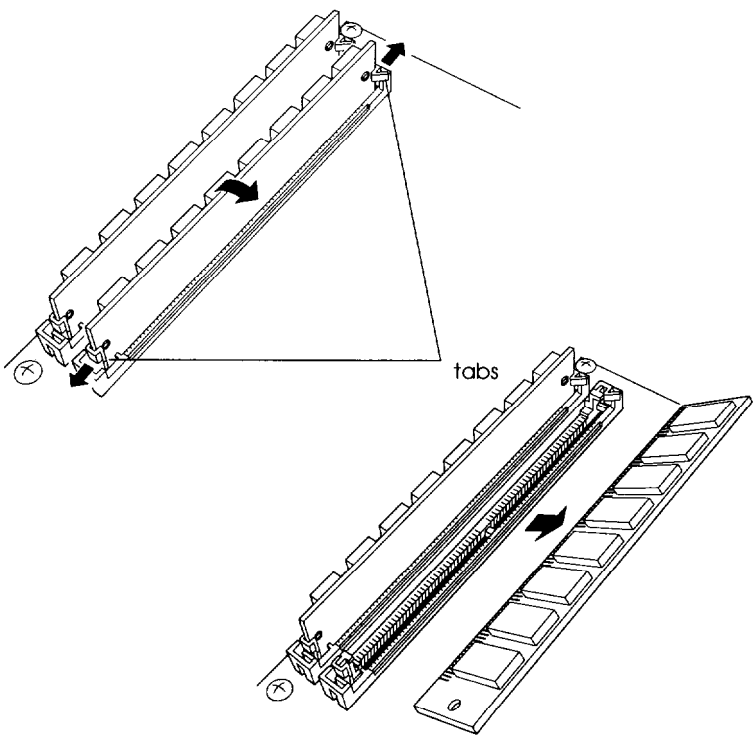
5. Replace any option cards you removed. (See page 3-14 for instructions.)

Removing SIMMs

If you need to remove SIMMs from your computer (to install different ones, for example), follow the steps below:

1. Remove any option cards that may be blocking your access to the SIMM sockets. (See page 3-17 for instructions.)

2. Use your fingers or a small screwdriver to carefully pull away the metal tabs that secure the SIMM at each end, as shown below. As you pull away the tabs, the SIMM falls to the side. Remove it from the socket.



3. If necessary, follow the same procedure to remove the other SIMM.

4. If you are inserting different SIMMs, follow the instructions on page 3-11 to install your new SIMMs.

5. Replace any option cards you removed, as described below,

Installing an Option Card

This s&ion explains how to install option cards in your computer. Your computer has three 16-bit, full-length slots and two 8-bit, half-length slots to accommodate a total of five option cards.

Usually it does not matter which slot an option card occupies as long as the card fits in the slot. For example, you can place some B-bit cards in a 16-bit slot. However, you cannot install a 16-bit card in an 8-bit slot.

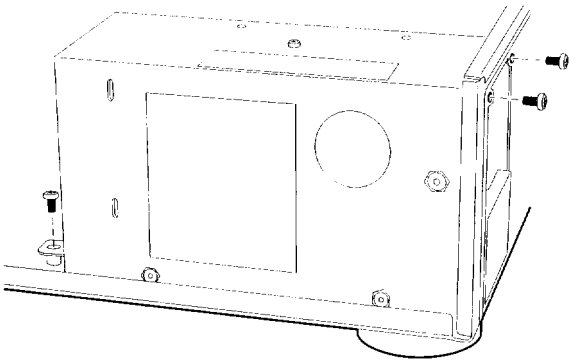
> **Caution**
> Make sure the power requirements for the option cards you install do not exceed the power supply limitations. See your option card manual(s) for the power requirements. Then check Appendix A for the option slot power limits. Note that older option cards that require -5 volts are not supported.

Before you install an option card, see if you need to change any jumper settings on the system board. For example, if you install a SCSI hard disk drive, you may need to change jumper J25 to disable the IDE hard disk drive controller. See page 3-6 for more information on jumpers.

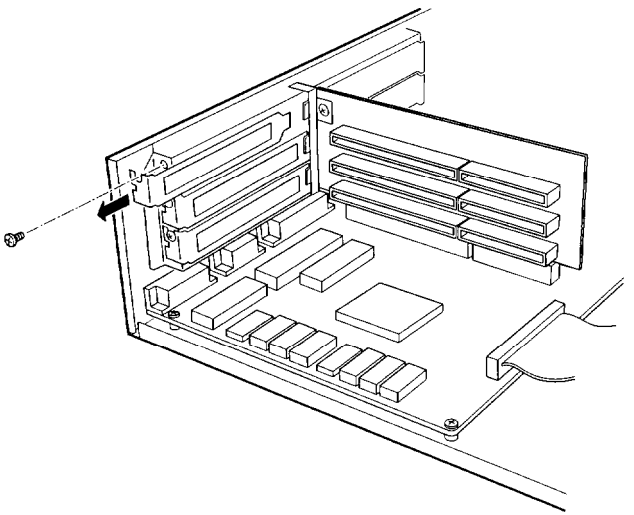
Refer to the illustrations below and follow these steps to install an option card:

1. If you are using a 16-bit option slot, go on to step 2. If you are using an 8-bit slot near the power supply, you need to move the power supply before you can remove the metal slot cover.

Remove the two retaining screws securing the power supply to the back of the computer and the third retaining screw holding the power supply to the base of the computer, as shown below. Be careful not to disconnect any of the cables. Slide the power supply out of the way.



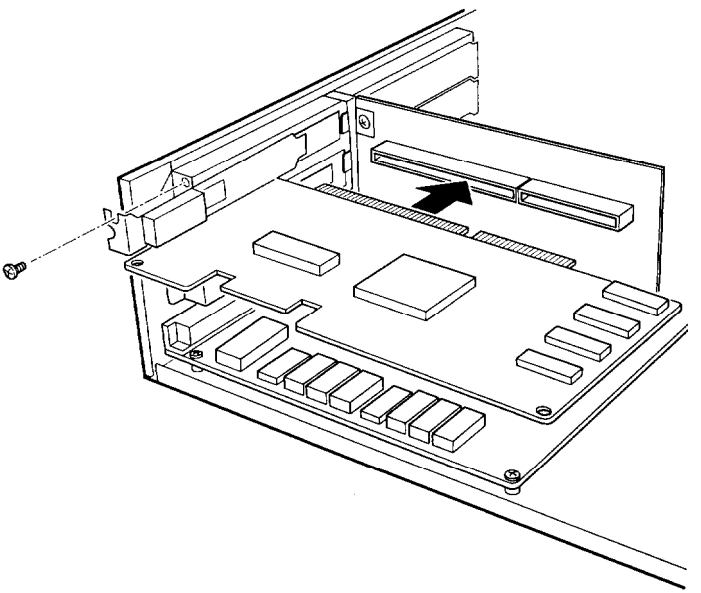
2. Remove the retaining screw securing the option slot cover to the computer, as shown below. (Keep the screw to secure the option card to the computer.)



3. Slide out the slot cover and set it aside. (Store it in a safe place in case you remove the option card later.)

4. Unpack the option card and adjust any switches or jumpers on it, if necessary. (Check the option card instructions.) When you handle the card, be careful not to touch any of the components on the circuit board or the gold-edged connectors. If you need to set it down before you install it, place it gently on top of its original packing material with the component side facing up. Keep the packing materials in case you remove the card later.

5. Hold the card along the top corners and guide it into the connector, as shown below. (If you are installing a full-length card, insert the front edge of the card into the corresponding guide inside the computer's front panel.)



Once the connectors reach the slot, push the card in firmly (but carefully) to insert it fully. You should feel the card fit into place. If it does not go in smoothly, do not force it; pull the card all the way out and try again.

6. Secure the end of the card to the computer with the retaining screw.

Removing an Option Card

You may need to remove an option card installed in your computer to access components on the main system board-to change a jumper setting, for example. You may also want to remove a card if you no longer need it. Refer to the option card illustration on page 3-16 and follow these steps:

1. Remove the retaining screw securing the option card to the computer. Then pull the card straight out of the slot.

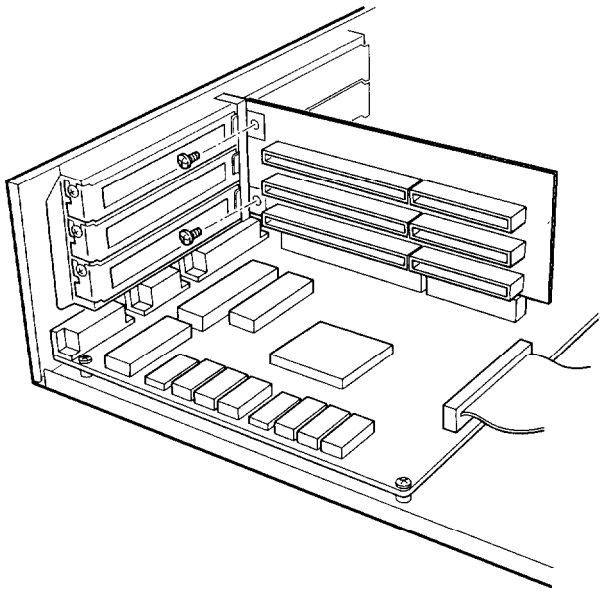
2. Set the card aside with the component side facing up

Removing the Option Card Connector Board

You may need to remove the option card connector board to replace the microprocessor installed on your system board. Follow these steps:

1. Remove any option cards from the connector board (see the section above).

2. Remove the two retaining screws securing the option card connector board to the back of the computer, as shown below.

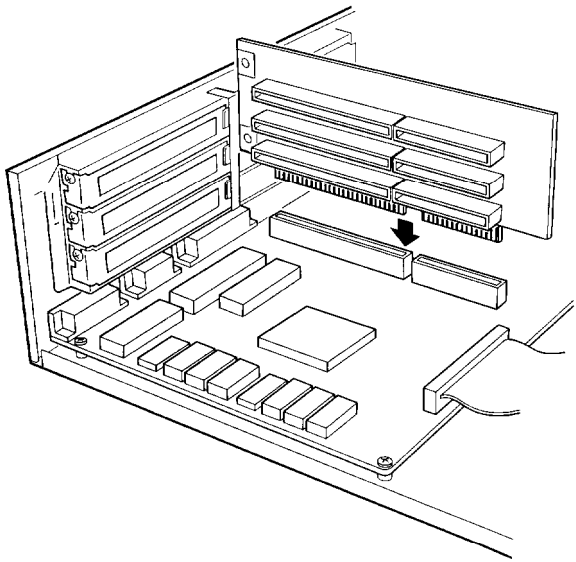


3. Pull the board straight up and out of its socket and set it aside.

Replacing the Option Card Connector Board

If you removed the option card connector board, follow these steps to replace it. Refer to the option card connector board illustration above.

1. Position the board above its slot and push it straight into the connector, as shown below.



2. Secure the board to the back of the computer with its two retaining screws.

3. Re-install any option cards you removed. See page 3-14.

Adding Video Memory

Your computer comes with 512KB of video memory. You can increase your video memory to 1MB by installing four video DRAM, 20-pin, 70ns or 80ns, 44256 DIP (Dual Inline Package) chips. This is useful for running graphics-intensive applications or for supporting resolutions up to 1024 x 768 on your monitor in 256 colors.

For the memory to work properly, you must install chips in the following configuration (each bank contains two video memory sockets).

Video *memory chip configuration*

Bank 0 (U18 and U39)	Bank 1 (U24 and U43)	Bank 2 (U25 and U47)	Bank 3 (U31 and U53)	Total memory
Soldered	Filled			512KB *
Soldered	Filled	Filled	Filled	1024KB

* Standard video memory

1. Locate the memory chip sockets on the main system board, shown on page 3-5.

   Bank 0 contains two chips soldered to the system board, so you cannot add video memory in this bank. Bank 1 contains the two filled sockets closest to the soldered chips. Bank 2 is the two middle sockets in each set of three and Bank 3 contains the remaining two sockets.

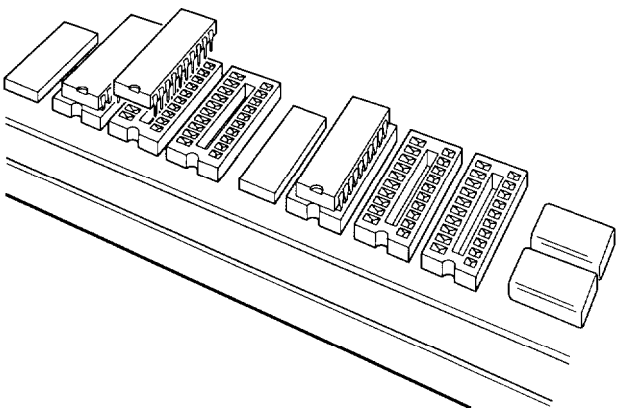
2. If there is an option card in your way, remove it. See page 3-17 for instructions.

> **Caution**
> To avoid generating static electricity and damaging the memory chips, ground yourself by touching the metal surface on the inside of the computer's back panel. Then remain as stationary as possible while you install them.

3. Remove the memory chips from their package and inspect each one. The pins should point inward at slightly less than a 90° angle.

If any of the pins are bent, straighten them gently with your fingers or with small tweezers to align them with the other pins. Be careful when you do this; the pins are fragile and can break off easily.

4. Position one of the memory chips over the first empty socket as shown below, aligning the pins on the chip with the holes in the socket. Make sure the small notch on the end of the chip is aligned with a similar notch on the socket.



5. Gently press the chip halfway into the socket (to make sure it is correctly aligned). If the chip goes in at an angle, remove it with a chip puller or a small flat-head screwdriver and try again,

6. When the chip is properly positioned, push down firmly on both ends of the chip to make sure it is well-seated.

7. Repeat steps 4 through 6 for each of the remaining chips.

8. Replace any option cards you removed. See page 3-14 for instructions.

When you start your computer, it displays the video memory briefly before it begins its memory test.

Installing *External Cache*

You can install either 32KB or 128KB of external cache on your system. Use five DRAM, 28-pin, 8 x 8,20ns or 25ns DIP chips to install 32KB or five 256 x 4,20ns DIP chips to install 128KB of external cache on your system.

1. Locate the external cache sockets on the main system board, shown on page 3-5.

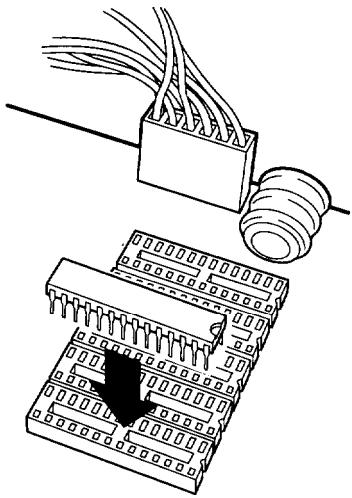
2. If there is an option card in your way, remove it. See page 3-17 for instructions.

> **Caution**
> To avoid generating static electricity and damaging the cache chips, ground yourself by touching the metal surface on the inside of the computer's back panel. Then remain as stationary as possible while you install them.

3. Remove the cache chips from their package and inspect them. The pins should point inward at slightly less than a 90° angle.

   If any of the pins are bent, straighten them gently with your fingers or with small tweezers to align them with the other pins. Be careful when you do this; the pins are fragile and can break off easily.

4. Position one of the cache chips over the first socket as shown below, aligning the pins on the chip with the holes in the socket. Make sure the small notch on the end of the chip is aligned with the corresponding notch on the socket.



5. Gently press the chip halfway into the socket (to make sure it is correctly aligned). If the chip goes in at an angle, remove it with a chip puller or a small flat-head screwdriver and try again.

6. When the chip is properly positioned, push down firmly on both ends of the chip to make sure it is well-seated.

7. Repeat steps 4 through 6 for each of the remaining chips.

8. Change jumpers J7, JlO, Jll, J13, and J14, as described on page 3-8, to correspond to the amount of cache you installed.

9. Replace any option cards you removed. See page 3-14 for instructions.

10. Run SETUP to enable the **External Cache** option and check that the **Shadow BIOS ROM** and **Shadow Video ROM** options **are set** to **Cacheable** or **WP-Shadow.** Make sure you save your settings as you leave SETUP (see Chapter 1).

When the computer restarts, it displays the amount of external cache you have installed on the system.

Upgrading the Microprocessor

You can upgrade your computer by replacing the microprocessor with a faster one. You can purchase upgrade kits from Epson or buy the individual components separately. The following table lists the components you can use to upgrade the microprocessor in your system.

Microprocessor upgrade components

Part	Manufacturer	Manufacturer's part number
486SX/33 processor	Intel	A80486SX-33 SX680B
486DX/33 processor	Intel	A80486DX-33 SX419
486DX2/50 processor	Intel	A80486DX2/50 SX626
486DX2/66 processor	Intel	A80486DX2/66 SX750
33 MHz oscillator	Ecliptek	EC1100
Heat sink and clip	EG&G	669-52AB
Two-position jumper	Foxcom	SJ05207

Use the table below to identify the general steps you need to perform to upgrade your microprocessor. Then see the page listed in the final column for instructions on performing those steps.

Possible microprocessor upgrades

If you install	You need to	See page
486SX/33	Remove the option card connector board	3-17
	Remove existing processor chip	3-26
	Install the 486SX/33 chip	3-26
	Replace the existing oscillator	3-29
	Replace the option card connector board	3-18
486DX/33	Remove the option card connector board	3-17
	Remove existing processor chip	3-26
	Install the 486DX/33 chip	3-26
	Replace the existing oscillator	3-29
	Change jumpers J1 and J2	3-8
	Replace the option card connector board	3-18
486DX2/50	Remove the option card connector board	3-17
	Remove existing processor chip	3-26
	Install the 486DX2/50 chip	3-26
	Install a heat sink on the chip	3-28
	Change jumpers J1 and J2	3-8
	Replace the option card connector board	3-18
486DX2/66	Remove the option card connector board	3-17
	Remove existing processor chip	3-26
	Install the 486DX2/66 chip	3-26
	Install a heat sink on the chip	3-28
	Replace the existing oscillator	3-29
	Change jumpers J1 and J2	3-8
	Replace the option card connector board	3-18

Replacing the Processor Chip

You'll find it easier to remove your existing microprocessor if you remove the option card connector board. Refer to page 3-17 to remove the option card connector board, then follow these steps to replace the processor chip:

1. Use the illustration on page 3-5 to locate the microprocessor on the system board.

> **Caution**
> Make sure you ground yourself by touching the metal surface on the inside of the computer's back panel before you touch the processor chip. Then remain as stationary as possible while you install it. Do not touch the pins on the processor chip. Handle the microprocessor only by the edges of its case.

2. If you use a chip puller, position the puller between the processor chip and the socket.

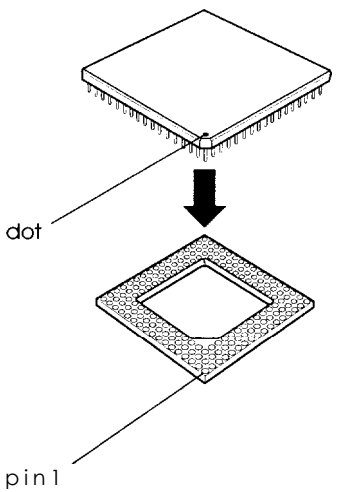
   You can also use a small, flat-edged screwdriver instead of a chip puller. Carefully wedge the tip of the screwdriver between the processor chip and the socket. Gently turn the screwdriver until the chip begins to separate from the socket. Move the screwdriver to another side of the processor chip and again turn it until the chip separates from the socket. Keep doing this until you can lift the processor chip straight up from the socket.

> **Caution**
> Your 486SX/25 microprocessor is soldered onto an adapter board that is seated in the microprocessor socket. Make sure you position your chip puller or screw driver just above the socket to avoid damaging the adapter board.

3. Gently pull the processor chip straight up and set it aside.

4. Remove the replacement chip from its package and inspect the pins. If they are bent, do not install the processor chip. Contact your vendor for a new microprocessor.

5. Position the processor chip over the socket, aligning the notched edge of the chip (marked with a dot) with pin 1 on the socket, as shown below. A corresponding notch is drawn on the circuit board under the socket.



6. Make sure the pins in the processor chip are directly over the holes in the socket. Then gently push the microprocessor straight into the socket, pressing evenly on all sides.

7. See the table on page 3-25 to see if you need to install a heat sink, replace the oscillator, or change jumper settings for the microprocessor you are installing. Then follow the appropriate instructions.

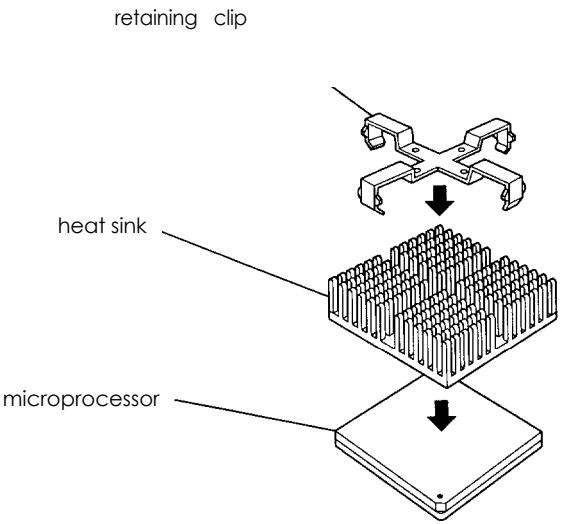
8. If you removed the option card connector board, see page 3-18 for instructions on replacing it. Then replace any option cards you removed.

Installing a Heat Sink

If you are installing a 486DX2/50 or a 486DX2/66 processor, you must install an EG&G heat sink (669-52AB) on the processor chip. Follow the instructions above to install the processor chip. Then follow these steps to install the heat sink:

1. Set the heat sink on top of the processor chip.

2. Place the retaining clip that came with the heat sink over the corresponding notches in the heat sink, as shown below.



3. Pull the edges of the retaining clip over the processor chip until they secure the heat sink to the processor chip. You may have to use a small flat-head screwdriver to do this.

Replacing the Oscillator

If you are installing a 486SX/33, a 486DX/33, or a 486DX2/66 processor, you must replace the existing oscillator with an Ecliptek 33 MHz oscillator (EC1100). Follow these steps to remove the existing oscillator and replace it with the new oscillator:

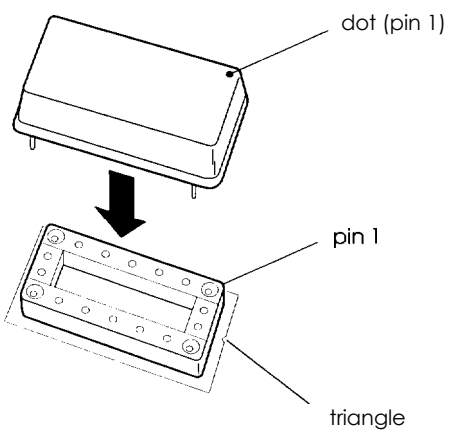
1. Use the illustration on page 3-5 to locate the oscillator on the system board.

2. Use scissors or a small knife to cut the tie wrap securing the oscillator to the system board, then discard the tie wrap.

3. Using your fingers, pull the oscillator straight up and set it aside.

4. Remove the new oscillator from its package, being careful not to touch the pins.

5. Position the oscillator over the socket. Make sure pin 1 (identified with a dot) aligns with pin 1 on the socket. A triangle traced on the system board identifies the side of the socket containing pin 1.



6. Gently push the oscillator into the socket.

7. Secure the oscillator to the system board using a new tie wrap. (If you didn't buy an upgrade kit, you must obtain the oscillator tie wrap separately.)

Post-installation Procedures

After you install or remove options such as memory modules or a microprocessor, you must run SETUP to update the computer's configuration. See Chapter 1 for instructions. Additionally, you may need to add some commands to your configuration files. See your operating system manual and the manual that came with your optional equipment.

Chapter 4

Installing and Removing Drives

This chapter describes how to install and remove optional drives in your computer. You can use these instructions to install a variety of devices, including hard disk drives, a diskette drive, a tape drive, or a CD-ROM drive. Although your drive may look different from the ones illustrated here, you should be able to install it the same way.

Your computer can hold up to three mass storage devices. You can install a hard disk drive in the internal hard disk drive bay. In the upper horizontal bay, you can install a second hard disk drive (if you have the right cable), a second diskette drive, a tape drive, or a CD-ROM drive.

To install or remove a drive, first remove the computer's cover as described in Chapter 3. Then follow the instructions in this chapter to install and remove drives:

- ❑ Installing a hard disk drive in the internal drive bay
- ❑ Removing a hard disk drive from the internal drive bay
- ❑ Installing a drive in the upper horizontal drive bay
- ❑ Removing a drive from the upper drive bay
- ❑ Reconnecting drive and power cables to the diskette drive in the lower drive bay
- ❑ Post-installation procedures.

If you are installing or removing a non-Epson drive, some of the steps in this chapter may not apply; see the documentation that came with your drive for more information.

Installing a Hard Disk Drive in the Internal Drive Bay

Your computer may have a hard disk drive already installed in the internal drive bay. If not, you can install a l-inch high by 3½ inch wide drive in this bay.

Here you will find steps for the following procedures:

- ❑ Removing the mounting frames from the hard disk drive (if necessary)
- ❑ Connecting the hard disk drive cables
- ❑ Installing the hard disk drive under the mounting bracket
- ❑ Installing the hard disk drive above the mounting bracket

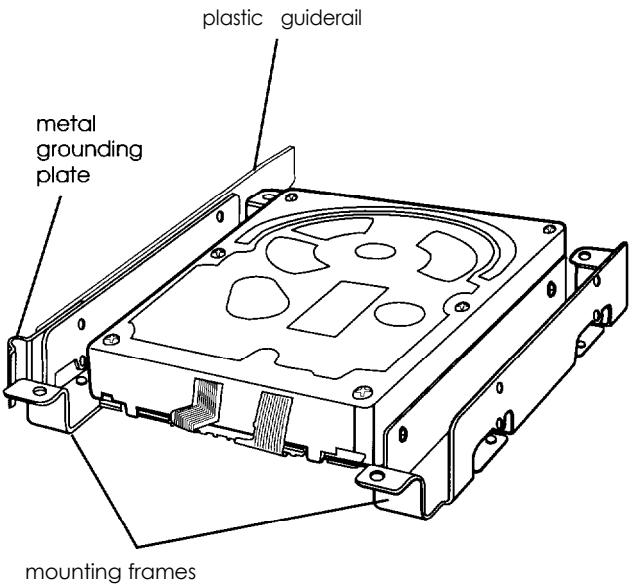
> **Note**
> Be sure to check the jumper settings on the drive before you install a hard disk drive. Also, you will need to know the number of cylinders, heads, sectors, etc. to select the correct drive type in the SETUP program. See the documentation that came with your drive for this information.

Before you can install a hard disk drive, you need to remove any option cards that may be blocking your access to the hard disk drive area. Once you have installed the drive, replace any option cards you removed. See Chapter 3 for instructions.

Removing the Mounting Frames

If there are mounting frames attached to your hard disk drive, you need to remove them before you can install the drive. Follow these steps:

1. On your drive, there may be a plastic guiderail and metal grounding plate attached to one of the mounting frames. If so, remove the screws securing them to the mounting frame and remove the guiderail and grounding plate.



2. Then remove the two screws securing each mounting frame to the drive and remove the frames.

Connecting the Hard Disk Drive Cables

To connect the hard disk drive to the computer, you need to connect two cables: the hard disk drive ribbon cable and a power supply cable.

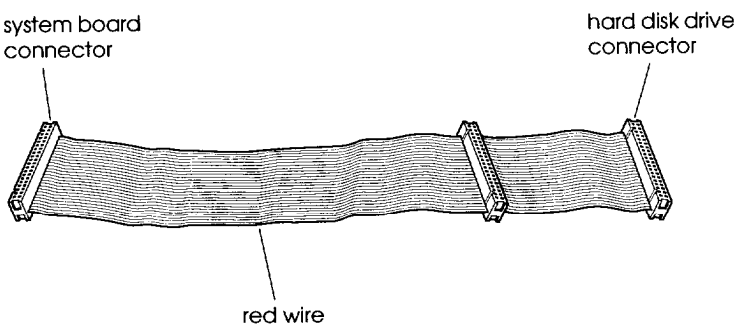
The hard disk drive ribbon cable is attached to your system board. You may need to remove it, for instance, to install a cable that supports two hard disk drives in this system. See "Connecting the drive cable to the system board," below, for instructions on reconnecting the cable to the system board. Otherwise, see page 4-6 for instructions on connecting the ribbon cable and power supply cable to the drive.

You should connect both the hard disk drive ribbon cable and the power supply cable to the drive before you secure it with the mounting bracket. You will not be able to attach them once the bracket is in place.

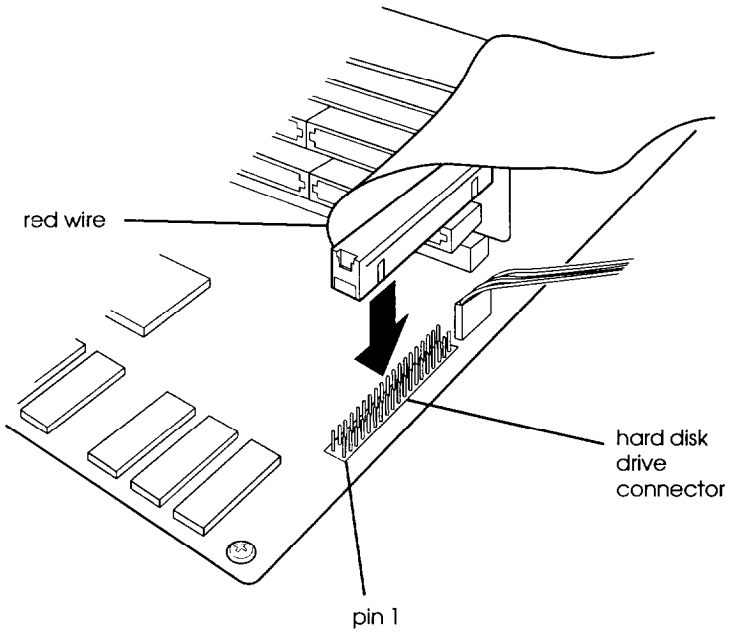
Connecting the drive cable to the system board

If you need to connect the hard disk drive ribbon cable to the system board, follow the steps below. (If the hard disk drive ribbon cable is already attached to the system board, see "Connecting the drive and power cables to the drive" on page 4-6.)

1. Locate the hard disk drive ribbon cable; it is a flat cable with a connector on each end and an additional connector on the ribbon cable.



2. Locate the hard disk drive connector on the system board.



3. Position one of the end connectors so that the red wire aligns with pin 1 of the connector on the system board. There is a "1" printed on the system board to identify pin 1.

4. Make sure the holes in the cable connector fit over the pins in the system board connector; then push in the cable connector.

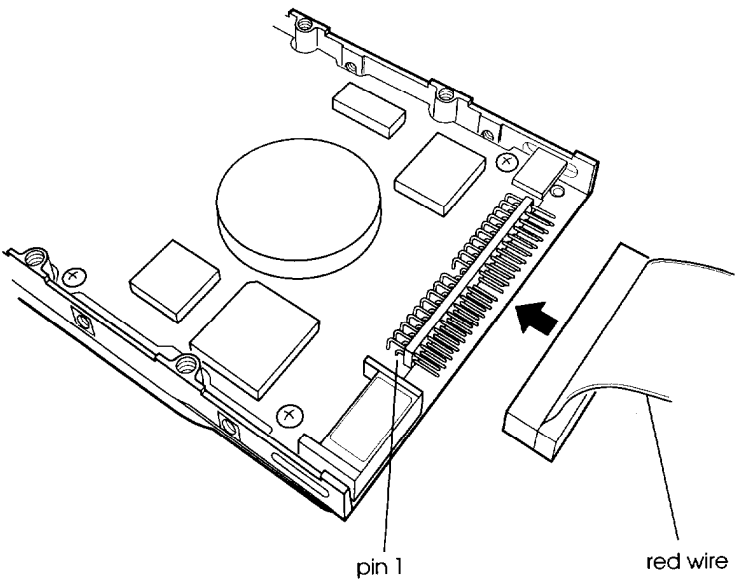
Caution
If you do not correctly align the holes with the pins, you could severely damage your system board when you push in the cable connector.

Connecting the drive and power cables to the drive

Follow the steps below to connect the hard disk drive ribbon cable and a power supply cable to the drive:

1. Locate the free connector on the end of the hard disk drive ribbon cable.

2. Locate pin 1 on the drive connector. If you do not see it on the connector casing, turn the drive over so you can see the drive's circuit board, as shown below. There is a "1" or "2" printed on the board to identify the side of the connector containing pin 1.



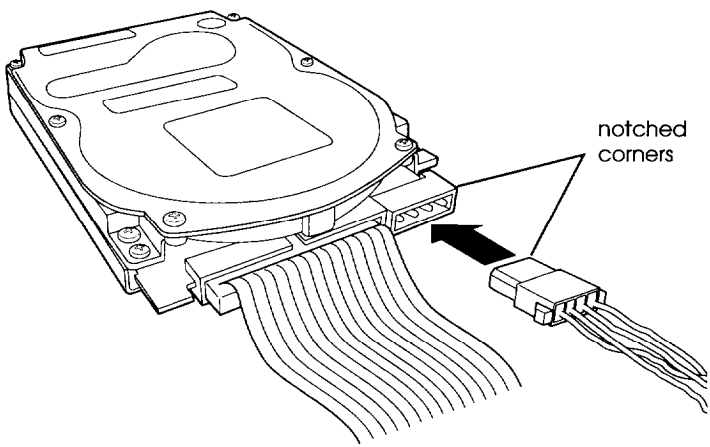
3. Position the connector on the cable so that the red wire aligns with pin 1 on the drive.

4. Make sure the holes in the cable connector fit over all the pins; then push in the connector.

Caution
If you do not correctly align the holes with the pins, you could severely damage your hard disk drive when you push in the cable connector.

5. Locate one of the power supply cables that lead from the power supply. (They have multi-colored wires and a plastic connector on the end.)

6. Position the power supply cable connector so that its notched corners line up with the notched corners of the power supply connector on the hard disk drive.



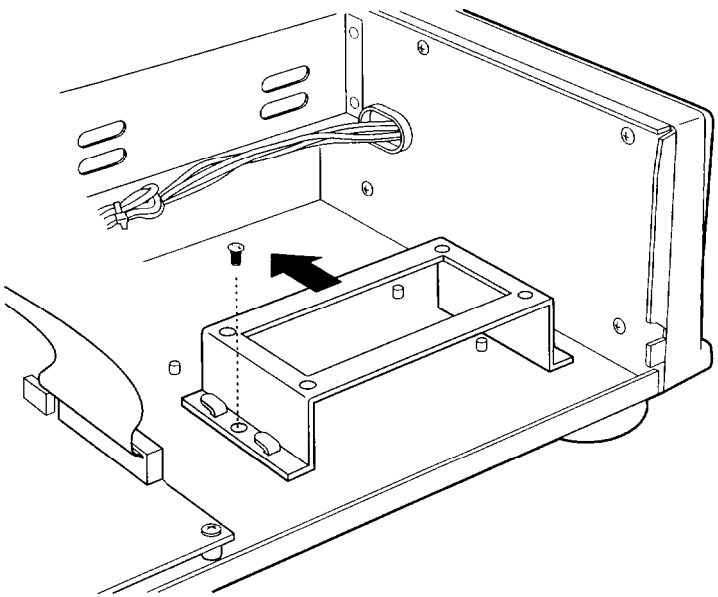
7. Make sure the holes fit over all the pins and then push in the connector.

Caution
If you do not align the cable connector correctly, you could severely damage your hard disk drive when you push it in.

Installing the Hard Disk Below the Mounting Bracket

If you have a l-inch tall hard disk drive, you can install it below the hard disk drive mounting bracket. Refer to the illustrations below and follow these steps:

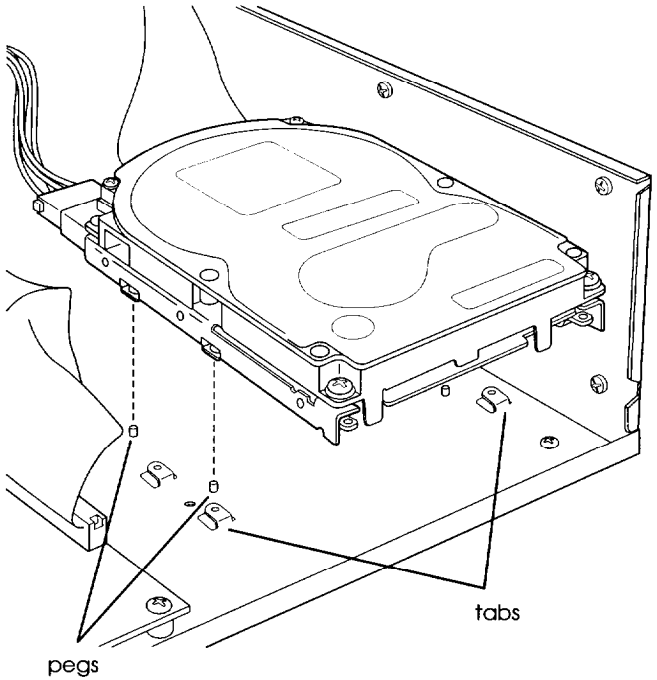
1. Remove the screw securing the mounting bracket to the base of the computer, as shown below.



2. Slide the mounting bracket toward the diskette drive bays, as shown above, until the slots clear the tabs.

3. Lift the mounting bracket out of the computer and set it aside.

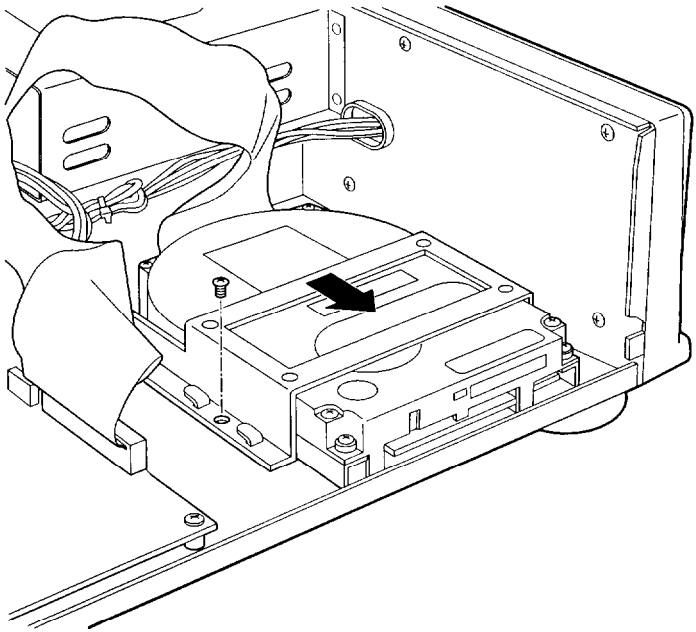
4. Align the hard disk drive so that the cables lead toward the diskette drive bays and the four holes at the base of the drive are above the four pegs, as shown below.



5. Gently lower the drive over the pegs. When the hard disk drive is resting on the pegs, it will not move from side to side.

6. Lower the mounting bracket over the hard disk drive, making sure that the slots in the mounting bracket fit over the tabs on the base of the computer.

7. Slide the bracket toward the side of the computer, as shown below, until the tabs hold the bracket in place.



8. Secure the mounting bracket with a screw on each side, as shown above.

Installing the Hard Disk On the Mounting Bracket

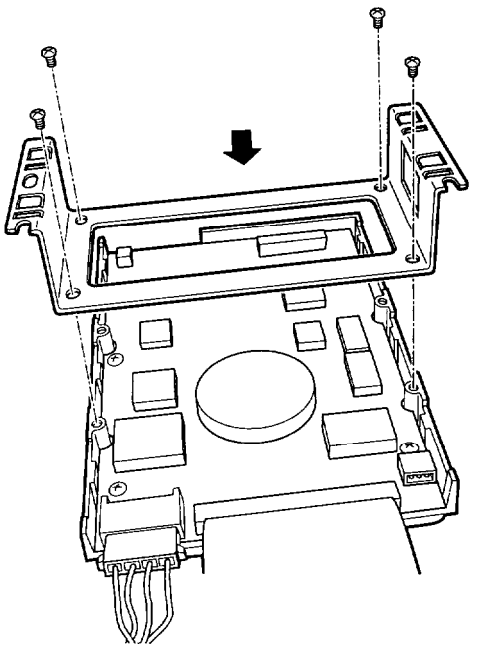
You can install a hard disk drive on top of the mounting bracket rather than under it. Refer to the illustration of the mounting bracket on page 4-8 and the one below while following these steps:

1. Remove the screw securing the mounting bracket to the base of the computer and slide the mounting bracket toward the diskette drive bays until the slots clear the tabs. (See the illustration on page 4-8.)

2. Lift the mounting bracket out of the computer.

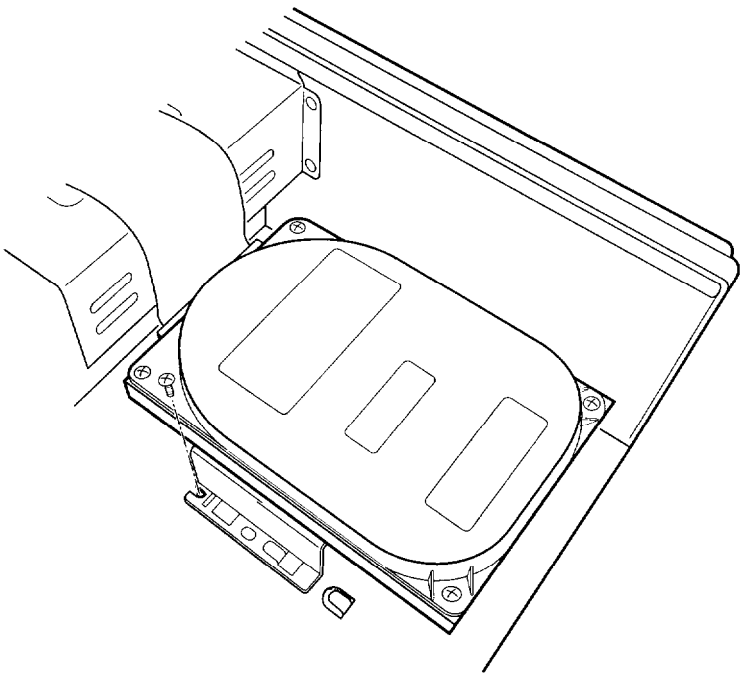
3. Turn the hard disk drive over and locate the four mounting holes on the drive.

4. Position the bracket on the hard disk drive, aligning the holes in the bracket with the holes on the drive.



5. Secure the bracket to the drive with four screws.

6. Turn the drive and the mounting bracket over, then slide the slots in the mounting bracket under the tabs at the base of the computer until the tabs hold the bracket in place.



Note
If the drive does not fit within the internal bay, you can move the mounting frame toward the power supply and align only one set of the slots on the mounting bracket with the tabs on the computer.

7. Secure the mounting bracket with the retaining screws.

Removing a Hard Disk Drive From the Internal Drive Bay

To remove a hard disk drive, reverse the installation steps outlined above. Then disconnect the hard disk drive ribbon cable and the power supply cable from the back of the drive. When you disconnect the cables, grasp the connectors and pull them straight out so you do not bend the pins; do not pull on the cables. Use the screws to again secure the hard disk drive mounting bracket to the base of the computer.

Installing a Drive in the Upper Horizontal Drive Buy

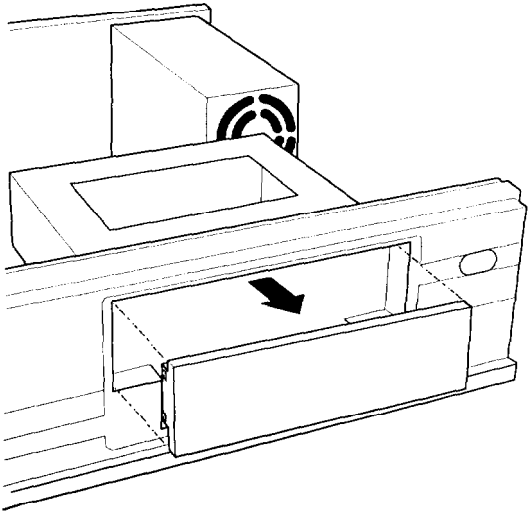
Your system comes with a 3.5-inch diskette drive installed in the lower horizontal drive bay. You can also install a diskette drive, a CD-ROM, a tape drive, or a second hard disk drive in the upper horizontal drive bay.

If you are installing a tape drive with a standard 5.25-inch diskette drive connector, you can connect it using the diskette drive cable that came with your system. If you install a second hard disk drive in this bay, make sure you purchase the appropriate cable to connect both drives to the hard disk drive connector.

Before you install a drive in the upper drive bay, remove the cover. Once you have the drive installed, replace the cover, following the instructions in Chapter 3.

Follow these steps to install a drive in the upper horizontal drive bay:

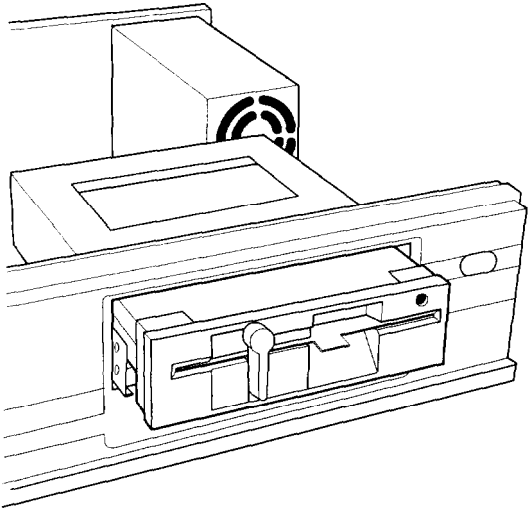
1. Remove the faceplate from the bay. Place your hand behind the plate through the hole in the drive bay, and push the faceplate forward, as shown below.



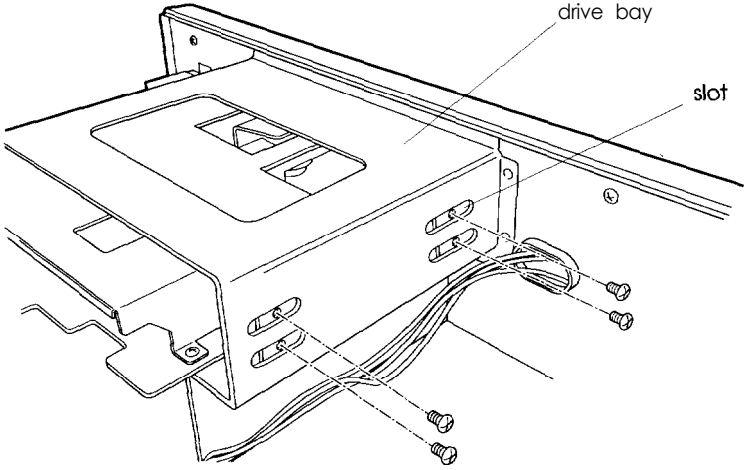
Keep the faceplate in a safe place in case you remove a drive later.

2. Remove any brackets or mounting frames from the drive. See page 4-3 for instructions.

3. Slide the drive into the bay until it is flush with the front of the computer.



4. Align the slots at the side of the drive bay with the mounting holes in the drive. Then secure both sides of the drive to the drive bay using the retaining screws.



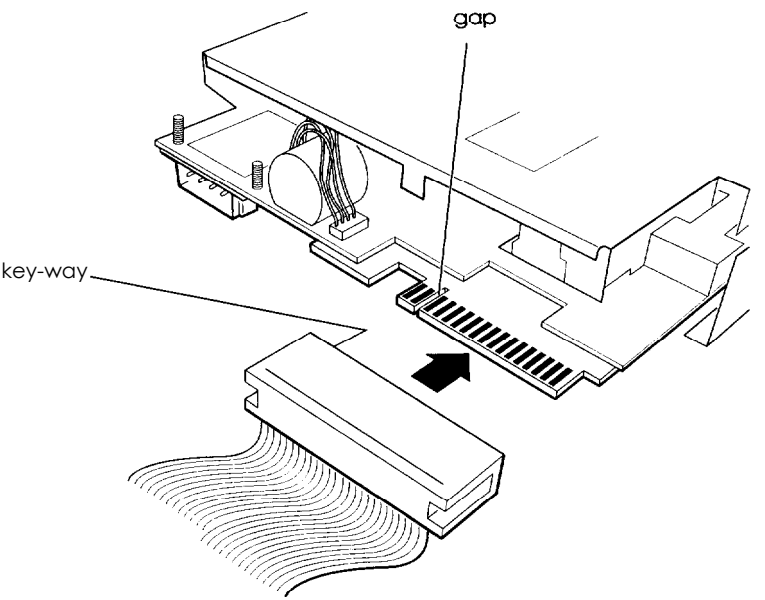
Connecting the Drive and Power Cables

To connect the drive to the computer, you need to connect both the drive ribbon cable and a power supply cable. Follow the steps below.

1. If you are installing a diskette drive, locate the diskette drive ribbon cable. (The connector in the middle of the cable is already connected to the system board.)

2. If you are installing a second diskette drive or a tape drive with a card-edge connector, one end of the cable is connected to the bottom diskette drive. Use the other connector on the ribbon cable to connect the drive to the system board.

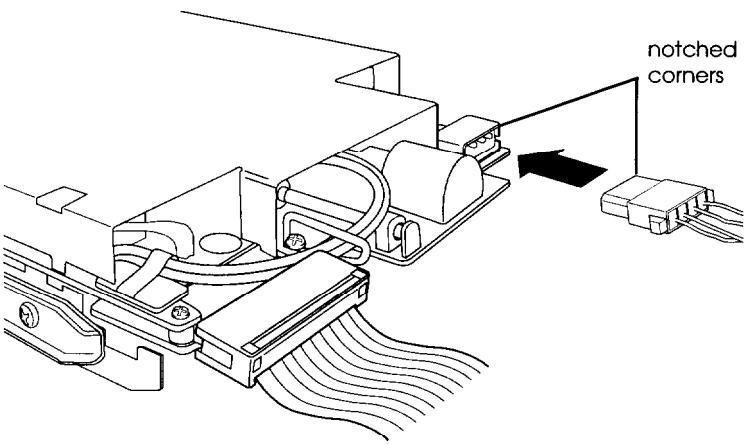
   Make sure you align the key-way (the plastic divider) with the gap in the drive connector, as shown below.



If you are installing a hard disk drive in the upper horizontal bay, make sure you use the proper hard disk drive ribbon cable and connect the ribbon cable to the hard disk drive connector. Also, if this is the second hard disk drive in your system, make sure you set the jumpers on both hard disk drives to indicate which is the master and which is the slave drive. See the documentation that came with your hard disk drive for instructions.

3. Locate one of the power supply cables that lead from the power supply. (They have multi-colored wires and a plastic connector on the end.)

4. Align the notched corners of the power supply cable connector with the notched corners of the drive's power supply connector (such as the one shown below). Make sure the holes fit over all the pins and then push in the connector.



Caution
If you do not align the cable connectors correctly, you could severely damage your drive when you push them in.

If you installed a diskette drive in the upper bay, it is drive B; the lower drive is A. However, if you want to reassign the upper diskette drive as drive A, you can change jumpers J35 through J38. See Chapter 3 for instructions.

Removing a Drive from the Upper Drive Bay

To remove a drive from the upper drive bay, follow these steps:

1. Remove both the ribbon cable connector and the power cable connector from the drive.

2. Remove the screws securing the drive.

3. Reach behind the drive and gently push it to the front of the bay; then pull it out of the slot.

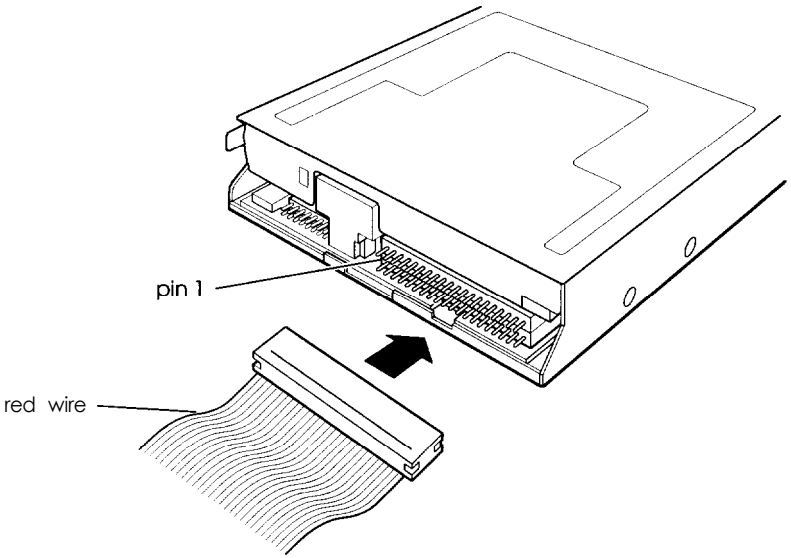
4. Once you have removed the drive, replace the faceplate by inserting one side of the plate, then gently guiding the other side into place. You will hear it snap into place.

Reconnecting the Drive and Power Cables to the Diskette Drive in the Lower Drive Bay

If for any reason you had to disconnect the drive and power cables from the diskette drive mounted in the lower drive bay, refer to the illustration below while you follow these steps to reconnect the cables:

1. Locate the pin connector on the diskette drive ribbon cable.

2. Identify pin 1 on the drive and align the connector so that the red wire is at pin 1, as shown below.



3. Locate the multi-colored power supply cable with the small connector. This cable is attached to the system board rather than the power supply.

4. Position the power supply cable connector so that the holes fit over all the pins. The red wire on the cable will align with pin 1 identified at the power connector on the circuit board of the drive.

Caution
If you do not align the cable connector correctly, you could severely damage your hard disk drive when you push it in.

Post-installation Procedures

After you install or remove your drive(s) and replace the cover **on** your computer, you need to run the SETUP program to define the correct configuration for your newly-installed drive. See Chapter 1 for instructions.

Chapter 5

Installing Video Drivers

The Utility diskettes included with your system contain enhanced VGA (video graphics array) drivers and utilities for your computer's built-in VGA adapter. This chapter describes how to install and use these drivers and utilities.

Your computer's built-in VGA adapter is compatible with IBM VGA. The drivers and utilities described in this chapter work with any VGA monitor or a compatible, multifrequency monitor that uses analog input.

Standard VGA monitors display resolutions up to 640 x 480, and you do not need to install the drivers or utilities for your system to operate properly with your application programs at this resolution.

However, you need to install the appropriate drivers if you want to use resolutions over 640 x 480 or to take advantage of these special features when using certain application programs:

- ❑ Enhanced graphic and text modes in 4,16, and 256 colors
- ❑ Resolutions up to 1024 x 768
- ❑ Extended text mode for 80-column text in 30, 43, and 60 rows and 132-column text with 25, 30, 43, and 60 rows.

Your computer comes with 512KB of video memory installed on the system board. You can upgrade the video memory to 1MB by installing additional video memory chips, allowing you to use higher resolutions in more colors. See Chapter 3 for installation instructions.

This chapter describes installation procedures for these common applications:

- ❑ Lotus 1-2-3 and Symphony, version 2.x (see page 5-3)
- ❑ Microsoft Windows, version 3.1 (see page 5-4)
- ❑ Microsoft Word, version 5.0 (see page 5-5)
- ❑ Quattro Pro, version 2.x (see page 5-6)
- ❑ WordPerfect, version 5.1 (see page 5-7)

Your Utility diskettes contain VGA utilities and drivers for additional applications. If you want to install these utilities or an extended video driver for an application not listed above, read the README files on your Utility diskettes. These files tell you what additional applications are supported and describe the VGA utilities. If your application is not listed, contact the software manufacturer.

Installing the Drivers

The information in this guide is organized alphabetically by application program or operating environment. To install a particular driver, turn to the page listed above for your application or environment.

> **Note**
> Each of the VGA drivers is designed to work with a specific version of software. Make sure the driver you select is compatible with the version of software you are using, or you may get unpredictable results.

Lotus 1-2-3 or Symphony

If you have not yet installed Lotus 1-2-3 or Symphony, follow the instructions in your Lotus documentation to install it. Then follow these steps to install the drivers:

1. Insert Utility Diskette 1 in drive A.

2. Type **A:** and press Enter to log onto drive A.

3. Copy the drivers from the Utility Diskette 1 to the Lotus or Symphony program directory on your hard disk.

   If you are installing drivers for l-2-3 to the C:\LOTUS directory, type the following and press Enter:

   ```
   SET123  C:\LOTUS
   ```

   If you are installing drivers for Symphony to the C:\SYMPHONY directory, type the following and press Enter:

   ```
   SETSYMPH  C:\SYMPHONY
   ```

4. Log onto your Lotus program directory.

5. Type **INSTALL** and press Enter to run the installation program.

6. From the main menu, select **Advanced options** and press Enter.

7. Thenselect **Add new drivers to library** and press Enter.

8. When the program finishes adding drivers to the library, select **Modify current driver set** and press Enter.

9. Select **Text display** to modify the text mode or **Graphics display** to modify the graphics resolution. Then press Enter.

10. Select the TVGA driver you want to install from the displayed list and press Enter.

11. Select **Return to menu** and press Enter.

12. At the Installation menu, select **Save changes.**

13. At the prompt, type the name you want to use for the driver set and press Enter.

14. Exit the Install program.

15. When you start 1-2-3 or Symphony, type **123** or **SYMPHONY,** followed by the name of the driver set you want to use, and then press Enter.

Microsoft Windows

If you have not yet installed Windows 3.1, follow the instructions in your Windows documentation to install it with the standard VGA driver. Then follow these instructions to install the new driver:

1. Log onto your Windows program directory.

2. Type **SETUP** and press Enter.

3. At the System Information screen, select **Display** and press Enter.

4. From the Display menu, select **Other (Requires disk provided by hardware manufacturer** 1 and press Enter.

5. Insert the Utility Diskette 1 in drive A.

6. Type the following path and press Enter:

```
A:\WIN
```

7. Select the driver you want to install.

8. Follow the instructions on the screen to finish running SETUP.

Microsoft Word

If you have not yet installed Word 5.0, follow the instructions in your Word documentation to install it. Then follow these instructions to install the appropriate driver:

1. Log onto your Word program directory.

2. Rename the driver file SCREEN.VID to the name SCREEN.OLD.

3. Insert the Utility Diskette 1 in drive A.

4. Copy the SCREEN.VID file from the diskette to your Word program directory. Type the following command and press Enter to copy the file:

```
COPY  A:\WORD\SCREEN.VID
```

5. Start your Word application,

6. Press **Esc** to enter a command.

7. Press O to enter an Option command.

8. Select **Display Mode.**

9. Press F1 to list the display modes available. Press ↓ to see additional drivers. Choose the display mode you want to use.

> **Note**
> Mouse support is not available for 132-column modes.

Your Word application now uses the display mode you selected.

Quattro Pro

If you have not yet installed your Quattro Pro application, follow the instructions in the Quattro Pro documentation to install it now. Then follow these steps to install the extended VGA drivers for Quattro Pro:

1. Log onto your Quattro Pro directory.
2. Insert the Utility Diskette 1 in drive A.
3. Type the following command and press Enter to copy the new display drivers to your Quattro Pro directory:

```
COPY  A:\QPRO\VIDEO.RSC
```

4. Start your Quattro Pro application.
5. Type **/o** to select the Options menu.
6. Type **D** to display the available display mode drivers.
7. Select **Trident VGA.**
8. Select the extended text mode you want to use.

Your Quattro Pro application now uses the display mode you selected.

WordPerfect

If you have not yet installed WordPerfect 5.1, follow the instructions in your WordPerfect documentation to install it. Then follow the instructions below to install the new drivers.

1. Log onto the WordPerfect directory on your hard disk.
2. Insert the Utility Diskette 1 in drive A.
3. Copy the extended text and graphics drivers from the utility disk to your WordPerfect directory by typing:

   ```
   COPY   A:\WP51\*.VRS
   ```

4. Start your WordPerfect application.
5. Press **Shift F1** to display the Setup menu.
6. Select **Display.**
7. Select **Graphics Screen Type.**
8. Choose **Trident TVGA.**
9. Select one of the extended graphics drivers. Choose from 800 x 600, 16 colors; 1023 x 768,16 colors; and 786 x 1024, **16** colors.
10. **Now** select **Text Screen Type.**
11. Choose **Trident vGA.**
12. Select the resolution you want for your text driver.

13. Select 0 to exit. Your selection is saved and used for displaying text as well as the print preview and graphics functions of WordPerfect.

Chapter 6

Troubleshooting

If you have any problems as you set up and use your computer, refer to this chapter. You can correct most problems by adjusting a cable connection, repeating a software procedure, or resetting the computer.

The troubleshooting suggestions in this chapter are organized in general categories, such as "The computer will not start." Within each category, a more specific problem is described with possible solutions.

If the suggestions here do not solve the problem, contact your Epson service representative or Epson Direct.

Identifying Your System

When you request technical assistance, be ready to provide the serial number of your computer, its system BIOS version number, its configuration (including the type of disk drives, monitor, and option cards), and the names and version numbers of any software programs you are using.

Use these guidelines to locate information about your system:

Serial number:	Look on the back panel of the computer to see the serial number.
Video BIOS version:	Restart your system. You'll see the video BIOS version number displayed on the screen when your system performs power-on diagnostics.
System BIOS version:	Start SETUP and display the System Information screen to see the system BIOS version number.
System configuration:	Start SETUP and look at both SETUP screens to see your system's configuration.
DOS version:	At the DOS prompt, type **VER** and press Enter to see the DOS version number.
Software versions:	In Windows applications, select "About" from the Help menu. As your software application starts, it usually displays a version number on the banner screen. Also, you can check your application documentation for a version number.

The Computer Will Not Start

The power light is on, but the computer does not start.

Replace your main operating system diskette and turn on the computer again.

> **Caution**
> If you turn off the computer, always wait at least 20 seconds before turning it back on. This prevents damage to the computer's electrical circuitry.

The computer does not start and the power light is not lit.

Make sure the power cord is securely connected to both the AC inlet on the back panel and an electrical outlet.

The power cord is secure/y connected, but the computer still does not start.

Check the electrical outlet for power. Turn off your computer and unplug the power cord. Plug a lamp into the outlet and turn it on.

If you have an Epson-supplied 80MB, 120MB, or 170MB hard disk drive installed, make sure you set the **`Shadow BIOS ROM`** option to **`WP-Shadow`** or **`Cacheable.`**

You installed of removed system components, and now your computer does not start.

Check to make sure you have reconnected all the internal and external cables correctly.

You may have installed option cards that exceed the system's power requirements. Check the power requirements in Appendix A.

If you replace the microprocessor, make sure the processor chip and the oscillators are both installed correctly. Also make sure pin 1 on the chip or the oscillator is connected with pin 1 on the system board. See Chapter 3.

The Computer Does Not Respond

The computer locks up.

Wait a few moments; if your computer does not respond after a reasonable length of time, press **Ctrl** Alt Del. If that doesn't work, press the **RESET** button.

You may have installed memory using SIMMs that work at **the** wrong speed. Install the correct SIMMs (see Chapter 3).

You reset the computer, but if still does not respond.

Try turning the computer off, wait 20 seconds, and turn it on again.

Your computer suddenly stops operating.

You may have overloaded the power supply limitations. See your option card manual(s) for the power requirements for your option card(s). Then check Appendix A to see if you have exceeded the option slot power limits.

Keyboard Problems

The screen displays a keyboard error message when you turn on of reset the computer.

Make sure the keyboard is securely connected to the correct port.

Nothing happens when you type on the keyboard.

See "The Computer Does Not Respond," above.

The cursor keys on the numeric keypad do not work properly.

If the Num Lock light in the upper right corner of the keyboard is lit, press NumLock to turn off the function.

If you want to change the initial settings of the num lock function, see "Setting Keyboard Options" in Chapter 1.

Monitor Problems

There is no display on the screen.

Check that the monitor's power switch is on and that its power light is on.

The power light is on, but you still do not see anything on the screen.

Check the brightness and contrast controls.

If you still do not see anything on the screen, make sure the monitor is securely connected to the computer.

If you installed a display adapter card, make sure your monitor and display adapter match. Also check to see if the card's switches or jumpers are set properly. If your display adapter card is not VGA, make sure you have your service representative disable the system's built-in VGA adapter for you.

If you are using a monochrome monitor that is not VGA compatible, make sure you change jumper 6 on the system board to position 2-3 (see Chapter 2) and select MONO for the **Video Card** option in SETUP (see Chapter 1).

If you are running an application program, see if you need to set up the program for the type of monitor and display adapter you have. Also make sure you are using the appropriate monitor and display adapter for your software.

> **Note**
> If your application program requires a monitor that supports graphics but you have a non-VGA monochrome monitor, the results will be unpredictable.

The power switch is on but the power light is not on.

Turn off the monitor's power, wait five seconds, and turn it back on.

If the light still does not come on, check the electrical outlet for power. Turn off your monitor and unplug it from the outlet. Then plug a lamp into the wall outlet and turn it on. If the light turns on, your monitor may be faulty.

Diskette Problems

You see a diskette error *message*.

Reinsert the diskette, making sure you insert it all the way. If the drive has a latch, turn it down to secure the diskette.

Also, check to see that you have inserted the right type of diskette in the drive. For example, make sure you are not inserting a high-density diskette in a double-density drive.

Reinserting the diskette does not solve the problem.

Insert the diskette in another diskette drive of the same type. If you can read the diskette in a different drive, your drive may be faulty.

The diskette is the right type, but you still see an error.

Check that the diskette is not write-protected, preventing the drive from writing to the diskette.

Make sure the diskette is formatted. See your operating system documentation for instructions on formatting diskettes.

You may have a defective diskette. Try copying the files from the bad diskette to a new diskette.

Something is *wrong* with *the data* in the files.

If you are using DOS, use CHKDSK to repair the files. You may also be able to use special utilities or diagnostics to solve this problem.

Diskette Drive Problems

A newly-installed diskette drive is not working properly.

Make sure you have installed the drive correctly and check all the cable connections.

You see a diskette drive error when you start your computer.

Run the SETUP program and configure your system for the correct type of diskette drive.

The diskette drive is making loud or unusual noises.

Contact your service representative or Epson Direct.

Hard Disk Drive Problems

A newly-installed hard disk drive is not working properly.

Make sure you have installed the drive correctly and check all cable connections. Also, check the jumper settings on your drive.

You see a hard disk drive error when you start your system.

Run SETUP and update your system configuration for the hard disk drive. Make sure you selected the correct drive type.

Make sure the jumpers on the system board are set correctly. See Chapter 3 for jumper information.

You are unable to store data on the hard *disk drive.*

Make sure you have partitioned and formatted the drive correctly for your operating system. Use the procedures provided in your operating system manual.

Also, make sure your hard disk drive has been physically formatted by the manufacturer. (All Epson-supplied drives are physically formatted at the factory.) If it has not been physically formatted, use the format utility that came with the drive to format it.

Note that a physical format is different from software-based formatting commands, such as the DOS FORMAT command.

You have been using your hard *disk drive successfully for some time but notice a reduction in performance.*

The data on the disk may have become fragmented. Back up all your data and use a disk compaction utility to reorganize the files on your disk.

If you cannot access data on your hard disk or you are seeing read/write errors, the disk may have a physical problem. Contact your service representative or Epson Direct.

Password Problems

You have forgotten your password.

As your system performs its power-on diagnostics, it displays a part number, prefaced by the letters "P/N" after the SEIKO EPSON CORP heading. Enter the first six digits of this number at the password prompt. You see the message, `OK!`, followed by the operating system prompt. The password option within the SETUP program is now set to **`Not`** `set`.

Software Problems

The application program does not start.

Check that you are following the correct procedure for starting the program and that it is installed correctly. If you do not have a hard disk, make sure the correct diskette is in the diskette drive. If you need help, contact your software manufacturer.

The application program is having trouble reading a key disk.

You may be running an application that requires a slower processor speed. See Chapter 2 for information on changing the processor speed.

Your application has locked the computer, making it unresponsive to keyboard commands.

Reset the computer and try again. If resetting the computer does not help, turn it off, wait 20 seconds, then turn it on again.

Some software, like OS/2, Unix, or NetWare 3.11, needs a minimum of 4MB to 8MB of RAM to work correctly. Check your software documentation for the minimum memory requirements. If necessary, add additional memory using the instructions in Chapter 3.

Printer Problems

The printer does not work at all.

Check that the printer has power and is properly connected to the computer. Also make sure your printer has paper in it.

The printer prints garbled information.

Check the printer manual for the printer's correct DIP switch or control panel settings.

Also, make sure you have the proper drivers installed for your printer and make sure you've selected the correct printer within your software application.

Option Card Problems

A newly installed option card is not working correctly.

Make sure the option card is installed correctly and is well-seated in its slot. Run the SETUP program to update your computer's configuration after you install the card. Also, perform setup procedures for any software you are using with the option card.

See the documentation that came with the option card to set any necessary DIP switches or jumpers on the card.

The computer may also have some jumpers that must be set for the option card to work properly. See Chapter 3 for system jumper information.

Your system may need to operate at the slower processor speed to access the device. Try reducing the processor speed (see Chapter 2).

You may have inserted an older option card that works at -5 volts. Make sure you install option cards that meet the system's power requirements.

An external device connected to the option curd is not working correctly.

Make sure you are using the proper cable to connect the device to the card.

Memory Module Problems

The memory count displayed by the power-on diagnostics program is incorrect.

You may have installed the SIMMs incorrectly. They may be the wrong type or speed, or they may not be inserted all the way. See Chapter 3 for information on installing SIMMs.

Mouse Problems

Your mouse isn't working properly or you see an auxiliary device error message.

Make sure the mouse cable is securely connected to one of the serial ports. Also make sure you installed the mouse driver correctly and selected the right settings for the serial ports in the SETUP programs. See the documentation that came with your mouse and Chapter 1 for instructions.

Controller Problems

You see a controller error for the hard disk drive controller or the I/O port controllers when you start your system.

The indicated controller on your system board may be faulty. If you have an option card with a controller that will work with your device, you can install it and change the jumper settings on the system board to disable the built-in controller. You can then continue to use your system until it is convenient for you to have it serviced.

External Cache Problems

The cache displayed by the power-on diagnostics program is incorrect.

You may have installed the external cache chips incorrectly. They may be the wrong type, or they may not be inserted all the way.

Also, you may not have changed your SETUP program to recognize the new cache. Make sure you have set the **External Cache** option to **Enable** and set both the **Shadow BIOS ROM** and the **Shadow Video** ROM options to **Cacheable** or **WP-Shadow.**

See Chapter 3 for information on installing external cache and Chapter 1 for instructions for using the SETUP program.

Appendix A

Specifications

CPU and Memory

32-bit CPU	Intel 80486SX/25 microprocessor; upgradable to 486SX/33, 486DX/33, 486DX2/50, or 486DX2/66
System speed	Fast and slow speeds available; fast speed is 25 MHz or the speed of your upgraded microprocessor, slow speed is 8 MHz; speed selection through SETUP program and keyboard commands
Memory	4MB RAM standard on a SIMM; expandable to 32MB using 1MB, 4MB, 8MB, and 16MB SIMMs; SIMMs must be tin-plated, 72-pin, 36-bit, fast-page mode type with 70ns or faster access speed
ROM	512KB system BIOS, video BIOS, and SETUP code located in EPROM on main system board
Video RAM	512KB DRAM on main system board; expandable to 1MB using 70ns or 80ns 44256 DIP chips
***Shadow* RAM**	Supports shadowing of system and video BIOS ROM into RAM
Cache	8KB of internal cache (built into the microprocessor); supports 32KB or 128KB of external cache using 28-pin, 8 x 8,20ns or 25ns DIP chips or 28-pin, 256 x 4,20ns DIP chips

Clock/ calendar	Real-time clock, calendar, and CMOS RAM socketed on main system board with built-in battery backup

Controllers

Video	Trident VGA controller on main system board; provides resolutions up to 1024 x 768 in 256 colors
Diskette	Controller on main system board supports up to two diskette drives or one diskette drive and one tape drive
Hard disk	Interface on main system board supports up to two IDE hard disk drives with built-in controllers

Interfaces

Monitor	VGA interface built into system board; 15-pin, D-shell connector
Parallel	One standard 8-bit parallel, uni-directional interface built into main system board; 25-pin, D-shell connector
Serial	Two RS-232C, programmable, asynchronous interfaces built into main system board; 9-pin, D-shell connectors
Game	One 15-pin, D-shell connector
Keyboard	PS/2 compatible keyboard interface built into main system board; num lock setting selectable through SETUP; 6-pin, mini DIN connector

Option slots	Three 16-bit, full-length and two 8-bit, half-length I/O expansion slots, ISA compatible, 8 MHz bus speed
Speaker	Internal
Muss storage	Two 3 ½ inch wide, third-height drives (one internal mount) and one 5 ¼ inch wide, half-height drive
Diskette drives	Your system supports the following diskette drives: 3.5-inch diskette drive, 1.44MB (high-density) storage capacity 5.25-inch diskette drive, 1.2MB (high-density) storage capacity 3.5-inch diskette drive, 720KB (double-density) storage capacity 5.25-inch diskette drive, 360KB (double-density) storage capacity
Hard disk drives	3½-inch form factor hard disk drive(s), up to half-height size; the first mounted internally, and the second mounted in the horizontal drive bay
Other devices	Half-height tape drive, CD-ROM, or other storage device; 5¼-inch or 3½ inch with mounting frames

Physical Characteristics

Width	15.6 inches (396 mm)
Depth	14.5 inches (368 mm)
Height	4.1 inches (104 mm)
Weight	15 lb (6.8 kg), without drives or keyboard

Power Supply

Type	65 Watt, fan-cooled
input ranges	*90* to *260* VAC
Maximum outputs	+5 VDC at 7.5 Amps, +12 VDC at 2.0 Amps, -12 VDC at 0.3 Amps
Frequency	*47* to 63 Hz

Option Slot Power Limits (Total)

Maximum current*	+5 Volts	+12 Volts	–12 Volts
For all slots	4.6 Amps	1.8 Amps	0.3 Amps

* This system does not support older option cards that may require –5 volts.

Environmental Requirements

Condition	Operating range	Non-operating range	Storage range
Temperature	41° to 90° F (5° to 32° C)	–4° to 140° F (–20° to 60° C)	–4° to 140° F (–20° to 60° C)
Humidity (non-condensing)	20% to 90%	10% to 90%	10% to 90%
Altitude	–330 to 9,900 ft (–100 to 3,000 m)	–330 to 39,600 ft (–100 to 12,000 m)	–330 to 39,600 ft (–100 to 12,000 m)

Tested Operating Environments

Although your system will run most software applications, the following operating environments have been tested for compatibility with your **system.** As new environments become available, these also will be tested.

MS-DOS 3.3 through 6.0
DR DOS 6.0
Novell NetWare 3.11*
Novell NetWare 2.2*
Novell NetWare Lite 1.l**
OS/2 2.0
SCO Unix 3.2.4
SCO Xenix 2.3.4
SCO Open Desktop 2.0
Windows 3.1
Windows for WorkGroup 1 .O

* Workstation only

** File server and workstation

† Do not use a user-defined hard disk drive type with this operating environment.

Your system has also received Novell's "Yes, NetWare tested and approved" certification as a workstation.

Available *Options*

The following list represents only a few of the options supported for this product. Call your nearest marketing location or Epson Direct for more information on specific options.

Options

Option	Product	Product code
Peripheral devices		
Monitors	14" VGA monochrome monitor	A880611
	14" VGA color monitor, 0.39 mm	A804321
	14" Extended color VGA monitor	A804211
	17" Professional Series monitor	A804241
	20" Professional Series monitor	A804341
	17" SII color monitor	CM1760LR-10
	20" SII color monitor	CM2070LR
Keyboards	101 USA	A800181
	102 Portuguese	A880232
	102 Enhanced Latin American Spanish	A880242
Mouse	9-pin serial mouse	A880282
Mass storage devices		
Additional diskette drives	5.25" 1.2MB FDD	A811371
	3.5" 1.44MB FDD	A811381
Hard disk drives	80MB HDD w/embedded AT controller	A812001
	120MB HDD w/embedded AT controller	A811951
	170MB HDD w/embedded AT controller	
	240MB HDD w/embedded AT controller	A811991
	251MB HDD w/embedded AT controller	
CD-ROM	Half-height CD-ROM	
Tape backup drive	Epson 250MB tape backup unit	A811613

Options (continued)

Option	Product	Product code
Memory expansion kits		
System memory	1MB SIMM memory expansion kit	A880791
	4MB SIMM memory expansion kit	A880801
	8MB SIMM memory expansion kit	A880811
	16MB SIMM memory expansion kit	A880821
Video memory	44256 DIP chips with 70ns or 80ns access speed	A880831
External cache	For 32KB; 28-pin, 8 x 8, 20ns or 25ns DIP chips (5 pieces)	A880841
	For 128KB; 28-pin, 256 x 4, 20ns DIP chips (5 pieces)	A880851
Processor upgrade kits		
486SX/33	486SX/33 processor, 33 MHz oscillator, tie wrap	A880722
486DX/33	486DX/33 processor, 33 MHz oscillator, tie wrap, two jumpers	A880732
486DX2/50	486DX2/50 processor, heat sink, retaining clip, two jumpers	A880742
486DX2/66	486DX2/66 processor, 33 MHz oscillator, heat sink, retaining clip, tie wrap, two jumpers	A880752
Other		
Network cards	Standard network interface card	
Printers		
9-pin	Epson LX-810, narrow carriage	C016231
	ActionPrinter 2250, narrow carriage	C100011
	FX-870, narrow carriage	C094001
	FX-1170, wide carriage	C095001
	DFX-5000, wide carriage	C112001
	DFX-8000, wide carriage	C030001
24-pin	ActionPrinter 3250, narrow carriage	C092011
	LQ-570, narrow carriage	C062001
	LQ-860, narrow carriage	C035031
	LQ-870, narrow carriage	C060021
	LQ-1070, wide carriage	C063001
	LQ-1170, wide carriage	C061021
	LQ-2550, wide carriage	L752

Options (continued)

Option	Product	Product code
Printers (continued)		
Lasers	EPL-8000	C09001
	ActionLaser 1000	C108001
	ActionLaser 1000 (2MB)	C108001-2
	ActionLaser 1500	C108101
Ink jet	Stylus 800 Ink Jet Printer	C106001
Color	Seiko Instruments color printers	
	Personal ColorPoint PSE	CH4104-PSE
	ColorPoint PSX "A" size	CH5504-RX10
	ColorPoint PSX "B" size	CH5514-RX18
	Professional ColorPoint PSH	CH6104-PSH
Software		
	Microsoft Windows 3.1	
	Epson MS-DOS 5.0, 5.25" diskettes	A807162
	Epson MS-DOS 5.0, 3.5" diskettes	A807172
	Epson MS-DOS 6.0, 3.5" diskettes	A880382
	Epson OS/2, version 2.0	A807062

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